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NOTICE

Attached are revised and additional sections for the [redacted] Supplement, Evaluation of Evidence on Soviet Guided Missile Production, a continuing report of the Production Working Group of the Guided Missile and Astronautics Intelligence Committee. This report was originally published as [redacted] subsequent revisions were published under report numbers [redacted]
[redacted]

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Holders of this looseleaf report should insert the revised and new sections alphabetically by city name, removing the outdated pages replaced by revisions. The revised Table of Contents, in which the revised and new sections are highlighted by single and double asterisks, respectively, may be used for quick alphabetical reference.

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LIST OF INSTALLATIONS

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ARSENYEV (SEMENOVKA)		
1	Aircraft Plant No 116	44-08-53N 133-15-11E
BIYSK		
1	Solid Propellant Rocket Motor Test Facility	52-31-00N 085-05-45E
2	Explosives Manufacturing Plant	52-29-15N 085-05-30E
	(Solid Motor Production Plant	52-31-05N 085-04-30E
DNEPROPETROVSK		
1	DMDPC Plant Areas	48-26-07N 034-59-29E
2	DMDPC Test Facility	48-26-07N 034-59-29E
IVANKOVO		
1	Ivankovo Aircraft Plant	56-45-15N 037-07-12E
KAMENSK-SHAKHTINSKIY		
1	Solid Propellant Rocket Motor Test Facility	48-18-50N 040-13-55E
2	Chemical Combine No 101	48-18-50N 040-13-55E
	(Solid Motor Production Plant	48-18-28N 040-12-38E
KEMEROVO		
1	Solid Propellant Rocket Motor Test Facility	55-26-00N 085-56-50E
2	Ammunition Loading and Ex- plosives Plant Raketa 392	55-24-08N 085-59-00E
	(Solid Motor Production Plant	55-26-00N 085-57-25E
KOMSOMOLSK-NA-AMURE		
1	Airframe Plant No 126	50-35-10N 137-05-30E
KRASNOYARSK		
1	Armaments Plant 4	56-00-05N 092-59-38E
2	Rocket Engine Test Facility	56-06-16N 093-25-58E
3	Solid Propellant Rocket Motor Test Facility	56-04-01N 093-03-25E
4	Explosives Plant Zlobino 580	56-02-28N 093-03-03E
	(Solid Motor Production Plant	56-03-42N 093-02-53E

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<u>City/</u> <u>Section No</u>	<u>Installation</u>	<u>Coordinates</u>
KUYBYSHEV		
1	Airframe Plant No 1	53-13-00N 050-17-20E
2	Aircraft Engine Plant No 24	53-11-55N 050-16-15E
3	Rocket Engine Test Facility at Kurumoch	53-32-05N 049-51-10E
4	Experimental Aircraft Engine Plant Krasnaya Glinka No 2	53-21-09N 050-11-58E
LENINGRAD		
1	Armaments Plant 232	59-51-45N 030-28-50E
2	Solid Propellant Rocket Motor Test Facility 1	60-03-40N 030-36-39E
	Test Facility 2	60-12-45N 030-42-10E
	Test Facility 3	60-15-30N 030-44-30E
3	Probable Rocket Motor R&D Plant Petrokrepost	59-59-10N 031-00-20E
MOSKVA		
1	Missile and Space Development Center Kaliningrad 88	55-55-25N 037-48-00E
2	Missile and Space Propulsion Development Center Khimki 456	55-54-18N 037-26-38E
3	Zagorsk Rocket Engine Test Facility Krasnozavodsk	56-25-20N 038-10-19E
4	Guided Missile R&D Plant Khimki 301	55-53-55N 037-25-29E
5	Guided Missile Plant Tushino 82	55-50-21N 037-27-15E
6	Guided Missile R&D and Produc- tion Center (Aerodynamic) Reutovo 67	55-45-43N 037-52-36E
7	Central Aerohydrodynamic Institute (TsAGI) Ramenskoye	55-35-00N 038-07-00E
8	Central Institute of Aviation Engine-Building (TsIAM)	55-33-55N 037-56-37E
9	Space Research Facility Tomilino	55-39-58N 037-56-05E
NIZHNYAYA SALDA		
1	Static Test Facility	58-09-48N 060-56-14E

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<u>City/ Section No</u>	<u>Installation</u>	<u>Coordinates</u>
OMSK		
1	Aircraft Engine Plant 29	54-57-40N 073-25-30E
2	Airframe Plant No 166	54-57-18N 073-25-32E
3	Rocket Engine Test Facility	55-25-18N 073-16-40E
ORENBURG		
1	Airframe Plant 47	51-48-00N 055-07-00E
PEI-CHING (PEKING)		
1	Guided Missile Development and Production Center Chang- hsin-tien	39-48-45N 116-07-54E
PERM		
1	Armament Plant 172	58-02-15N 056-18-20E
2	Aircraft Engine Plant 19	57-58-32N 056-15-07E
3	Rocket Engine Test Facility	58-00-57N 056-34-14E
4	Solid Propellant Rocket Motor Test Facility	57-57-05N 055-51-00E
5	Munitions and Chemical Com- bine K. Kirov 98	57-58-31N 055-54-15E
	(Solid Motor Production Plant	57-58-30N 055-52-00E
PRIMORSK		
1	Static Test Facility	60-18-20N 028-50-30E
SARATOV		
1	Airframe Plant No 292	51-29-57N 045-57-09E
STERLITAMAK		
1	Solid Propellants Test Facility	53-42-25N 055-57-05E
2	Explosives Plant No 850	53-41-57N 055-57-37E
	(Solid Motor Production Plant	53-42-40N 055-57-35E
TAI-YUAN		
1	Probable Solid Propellants Test Facility	37-59-55N 112-33-00E
	(Solid Motor Production Plant	37-59-37N 112-33-15E

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LIST OF INSTALLATIONS (Continued)

<u>City/</u> <u>Section No</u>	<u>Installation</u>	<u>Coordinates</u>
TBILISI		
1	Aircraft Assembly Plant No 31	41-39-55N 044-52-50E
TYURATAM MISSILE TEST CENTER, LAUNCH COMPLEX J		
1	Missile Assembly and Check-out Facility	45-55-05N 063-17-35E
UFA		
1	Aircraft Engine Plants No 26A and No 26B	54-47-35N 056-07-28E 54-47-58N 056-04-18E
2	Static Test Facility	54-58-22N 056-04-06E
ULAN-UDE		
1	Airframe Plant 99	51-51-20N 107-44-00E
VORONEZH		
1	Rocket Engine Test Facility	51-34-32N 039-09-49E
VOTKINSK		
1	Arms Machine and Steel Plant 235	57-03-10N 053-59-35E
ZELENOGORSK		
1	Static Test Facility	60-13-45N 029-43-30E
ZLATOUST		
1	Armament Plant 66	55-06-10N 059-42-45E

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BIYSK

	<u>Section</u>
City of Biysk	0
Solid Propellant Rocket Motor Test Facility	1
Explosives Manufacturing Plant (includes Solid Motor Production Plant)	2

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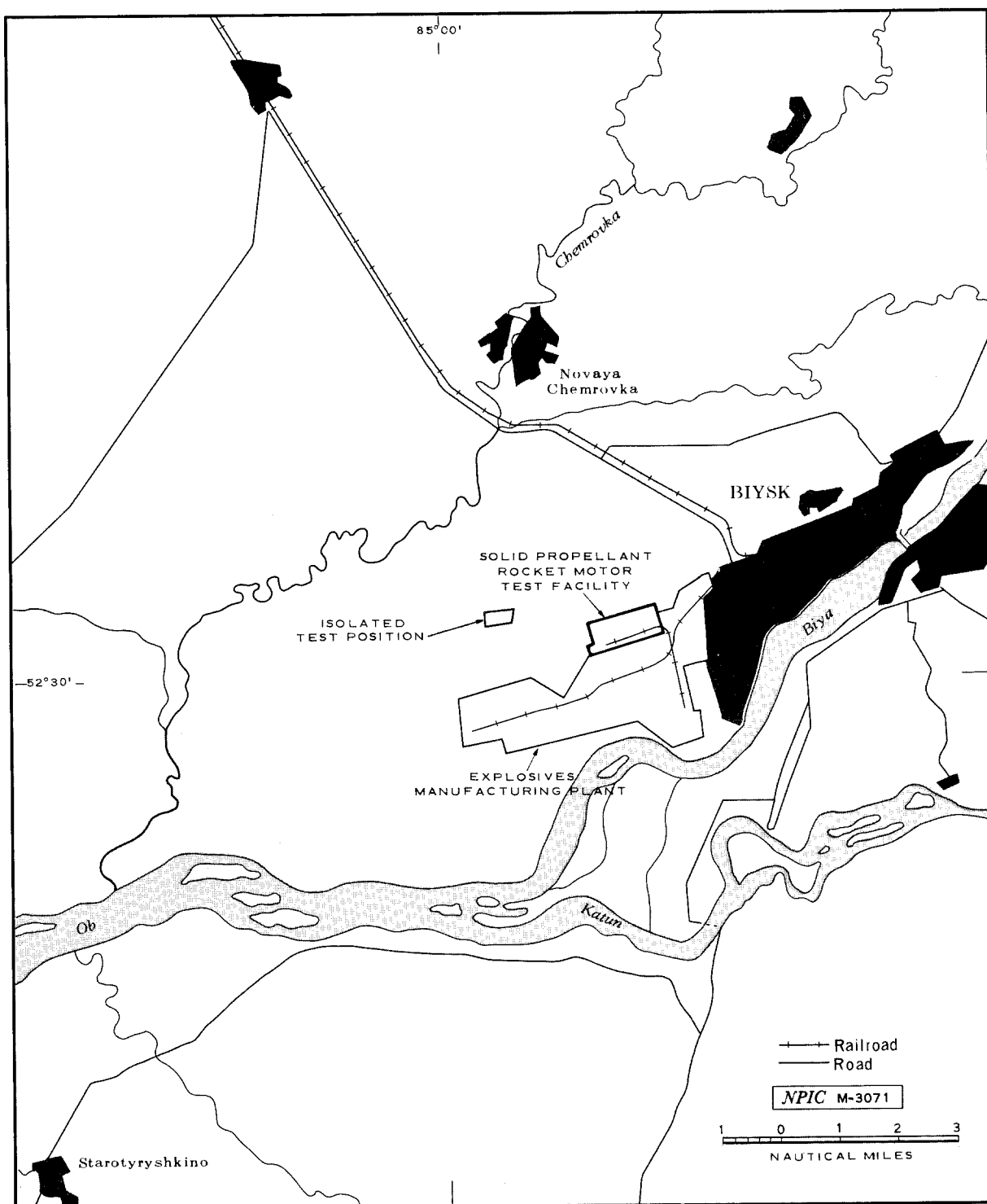


FIGURE 1. USSR: CITY OF BIYSK.

Biysk 0-2

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FIGURE 2. USSR: CITY OF BIYSK

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Biysk 0-3

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25X1**BIYSK: SOLID PROPELLANT ROCKET MOTOR TEST FACILITY**

52-31-00N 085-05-45E; [REDACTED]

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Tel/Ad ---; PO Box ---; Zone ---; T/P ---

Introduction

The Solid Propellant Rocket Motor Test Facility is located in the western outskirts of Biysk, USSR, on the north edge of the Biysk Explosives Manufacturing Plant (see Section 2); the 2 facilities are associated. The test facility includes 2 test cells, possible temperature conditioning/motor storage buildings, and various associated structures. An isolated test position is located in a separately secured area northwest of the facility. The following chronology is based on photographic coverage through June 1967.

Photographic Chronology

The Biysk Solid Propellant Rocket Motor Test Facility was observed for the first time on KEYHOLE photography of poor interpretability in [REDACTED]. The facility was then in an early stage of construction; the H-shaped building (item 10), later identified as a checkout/assembly building, was under construction, and construction had possibly begun on the 2 test cells. By [REDACTED] the identification of the large test cell (item 11) could be confirmed, the H-shaped building had been completed, and the small test cell (item 13) was still under construction; a new secured area 8,755 feet northwest of the test facility was in an early stage of construction. No changes could be discerned on the subsequent photography of poor interpretability in [REDACTED].

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Photography of [REDACTED] provided good interpretability, revealing that the small test cell had been completed, 4 large and 4 small support buildings had been built, and a small disposal area had been added just west of the facility. A small cloud of smoke visible near the U-shaped revetment in the secured area northwest of the facility provided the first evidence of possible testing activity at the facility.

The only usable 1963 photography of the facility was obtained in [REDACTED] when the following new additions were observed: a group of 3 offset buildings, later identified as possible temperature conditioning/motor storage buildings; a building in the secured area northwest of the facility; and construction activity west of the small test cell. A second group of possible temperature conditioning/motor storage buildings had been added east of the test facility by February 1964. [REDACTED] revealed no apparent change.

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The good interpretability of the [] permitted the identification of the construction west of the small test cell as a shell-testing/small rocket test range and of the secured area northwest of the facility as an isolated, revetted, single test position. The number of possible temperature conditioning/motor storage buildings had increased to 17, arranged in 2 groups of 5, 1 group of 4, and 1 group of 3; steamlines served these buildings and the 2 main test cells. Sometime between July and September 1964 a semicircular area approximately 1.5 nautical miles in diameter surrounding the isolated single test position had been fenced, and a rail line which previously passed through the site had been detoured around the fence. In [] 3 building excavations were visible in the vicinity of the possible temperature conditioning/motor storage buildings, 2 immediately east of them and one to the north.

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The results of testing in the test facility proper were observed for the first time in [] when a dark possible blast mark was visible between the blast deflector and the cell building at the large test cell. Two more building excavations were present west of the possible temperature conditioning/motor storage buildings. At the isolated test position, dark stains were observed on the bank near the test position, and preliminary excavations were visible at the foot of the cliff west of it. [] buildings were under construction in the 5 excavations observed previously in the vicinity of the possible temperature conditioning/motor storage buildings, and 2 more excavations were visible. Photography of [] revealed that construction was continuing within the test facility, and 3 large excavations were visible on the face of the cliff west of the U-shaped revetment in the isolated test position.

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The test facility was photographed during 5 KEYHOLE missions in 1966; 3 were KH-4 missions, 1 a KH-7, [] Photography of [] provided the best coverage of the year. No changes were observed at the isolated test position; 3 additional support structures were completed or under construction at the east end of the test facility area. No changes were observed in the operating section of the facility.

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Six KEYHOLE missions photographed the facility in the first half of 1967, 4 of them KH-4 and 2 KH-7. The best photography to date was obtained in [] []; no major changes or additions to facilities were observed, but a large rocket motor was visible in the firing position at the isolated test position and a possible smaller motor was seen on a rail carrier in the test facility.

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Discussion & Evaluation

On the basis of photographic evidence, this installation has been identified as a solid propellant rocket motor test facility. It is probably utilized for the testing of solid motors produced at the adjacent Biysk solid motor production plants (see Biysk, Section 2). The facility probably became operational during the second half of 1964.

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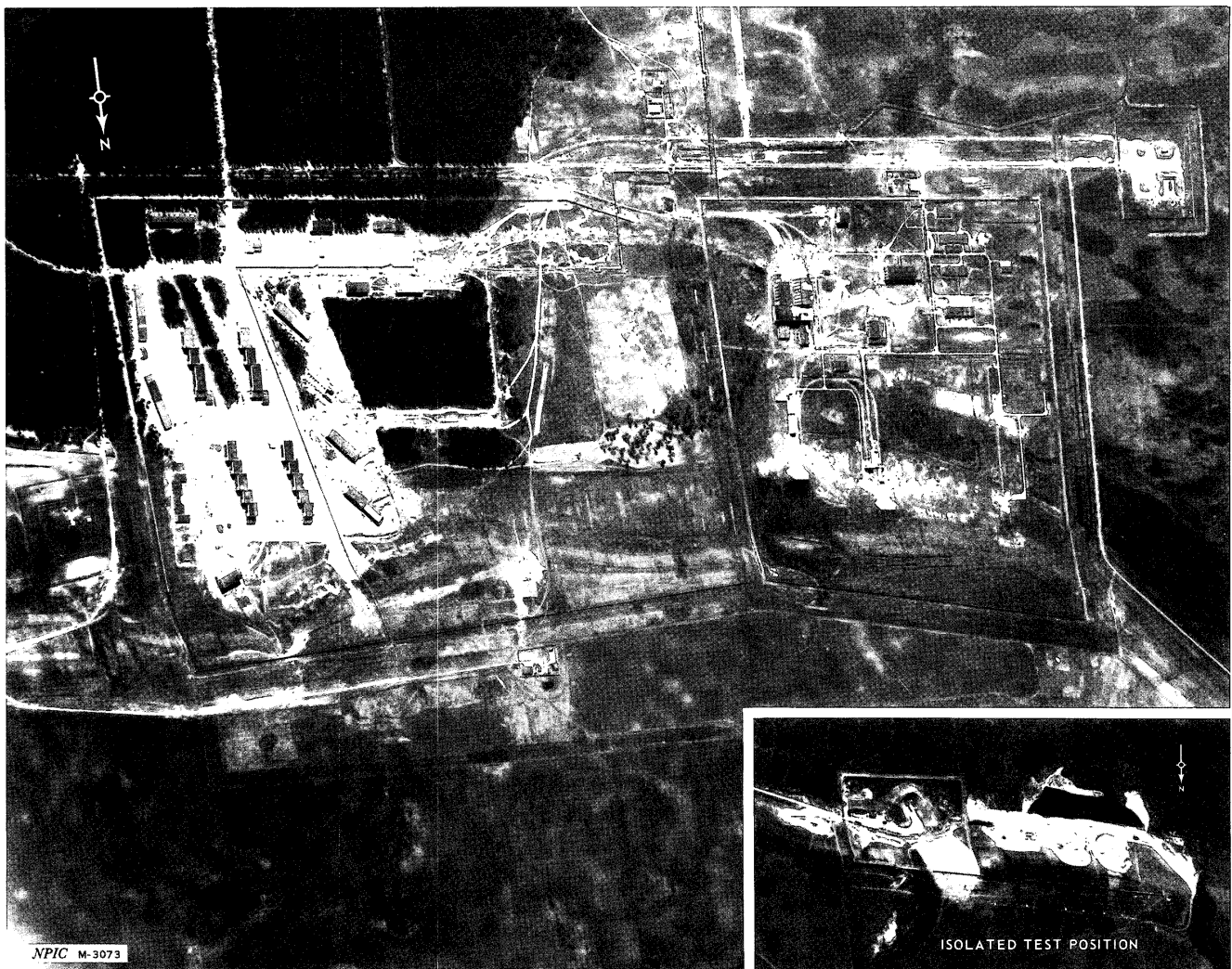


FIGURE 1. USSR: SOLID PROPELLANT ROCKET MOTOR TEST FACILITY AT BIYSK

Biysk 1-2

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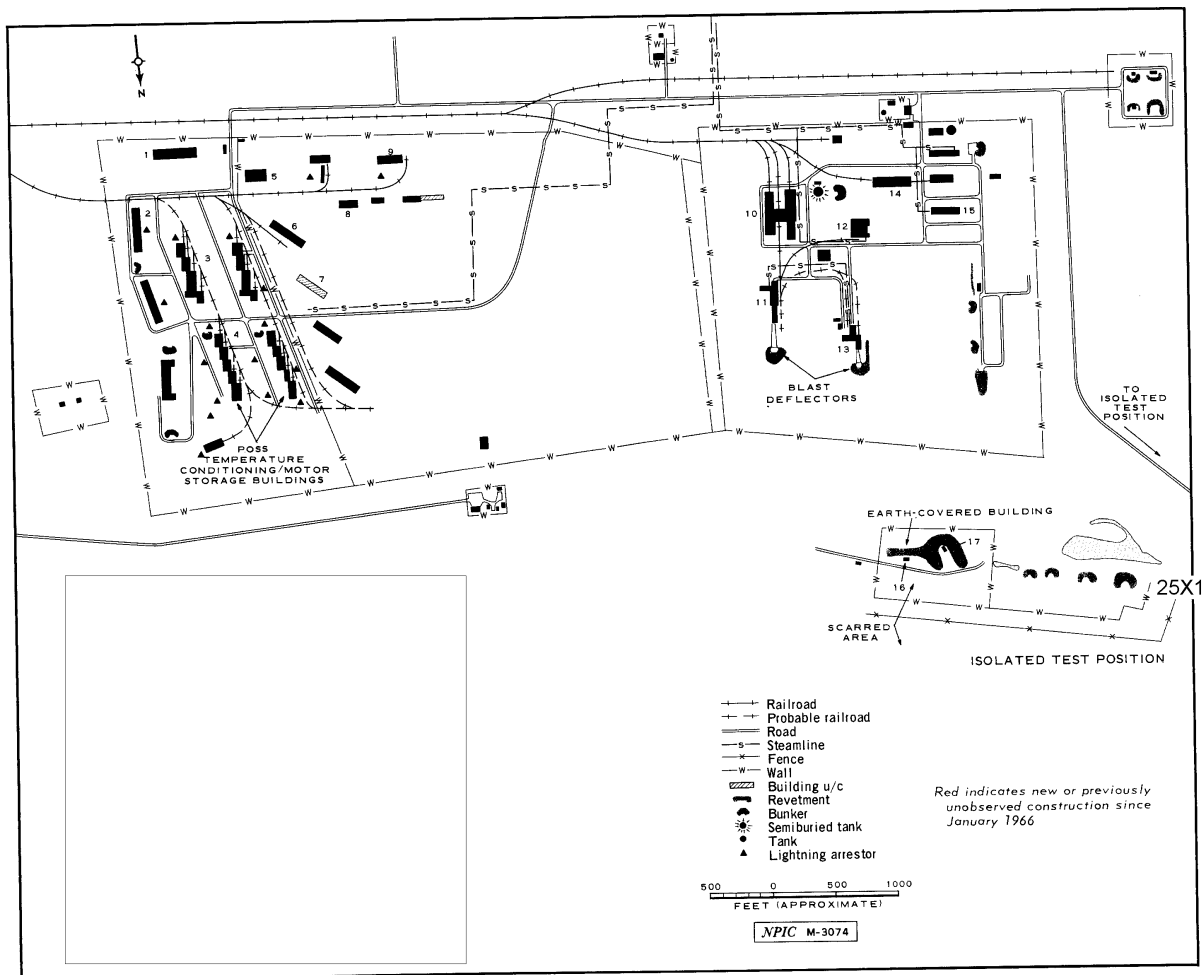
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FIGURE 2. USSR: LAYOUT AND ROOF COVERAGE OF SOLID PROPELLANT ROCKET MOTOR TEST FACILITY AT BIYSK.

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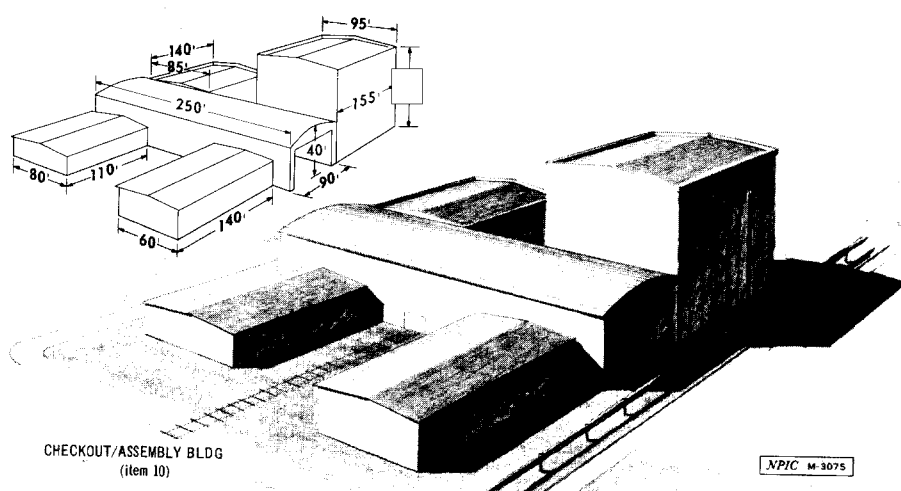
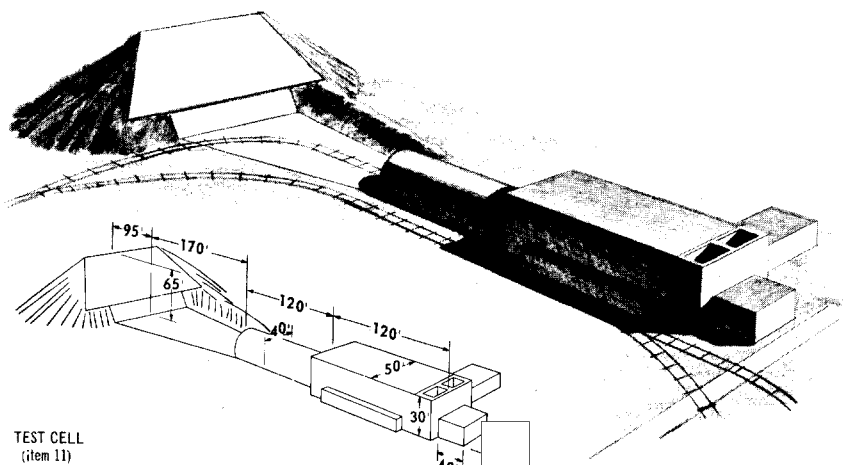
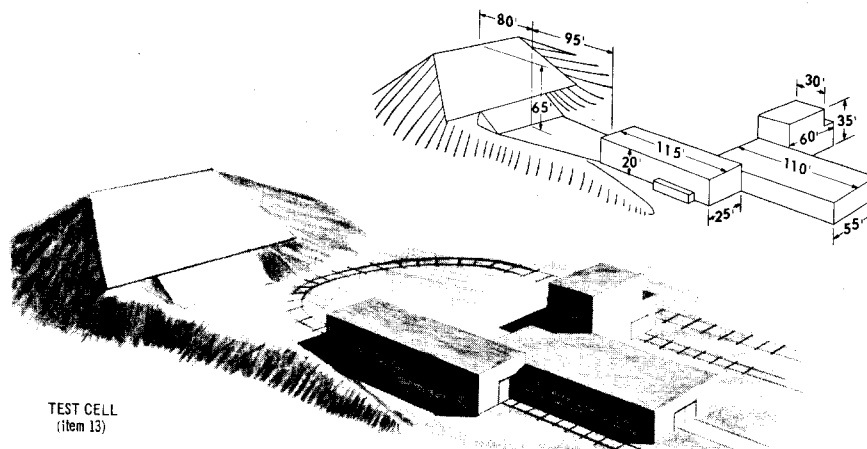


FIGURE 3. USSR: PERSPECTIVE VIEWS OF 3 STRUCTURES AT SOLID PROPELLANT ROCKET MOTOR TEST FACILITY AT BIYSK, (Item numbers appear on Figure 2).

Biysk 1-4

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25X1**BIYSK: EXPLOSIVES MANUFACTURING PLANT**

52-29-15N 085-05-30E; [REDACTED]

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Tel/Ad SOSNA; PO Box 47; Zone 15; T/P ---

SOLID MOTOR PRODUCTION PLANT

52-31-05N 085-04-30E; [REDACTED]

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Introduction

The Explosives Manufacturing Plant is located in the western outskirts of Biysk, USSR, south and east of the associated Solid Propellant Rocket Motor Test Facility (see Section 1). The principal parts of the plant complex are the Double-Base Propellant Plant (Figures 1 and 2); the Modified Solid Propellant Plant (Figures 3 and 4); and the High-Explosives (HE)/Industrial-Explosives Plant (Figures 5 and 6). The following chronology is derived from photography through June 1967.

Photographic Chronology

The Biysk Explosives Manufacturing Plant was first observed on KEYHOLE photography of poor interpretability in [REDACTED]; at that time the Double-Base Propellant Plant and the northern portion of the HE/Industrial-Explosives Plant were probably partially operational, but the status of the southern portion and of the Modified Solid Propellant Plant could not be determined.

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Although the interpretability of the [REDACTED] was poor, several buildings could be observed in the Modified Solid Propellant Plant, some of which were heavily revetted. In [REDACTED] a structure was present in the Double-Base Propellant Plant which was later identified as a part of the casting facility (item 17, Figure 2, and Figure 7). Later, in [REDACTED], construction activity was under way in the possible sulphuric acid plant located in the HE/Industrial-Explosives Plant. By [REDACTED] new facilities in the Modified Solid Propellant Plant (Figure 4) included a large fabrication-type building (item 4) in the midstage of construction, an L-shaped probable engineering/laboratory building (item 3), and 4 more revetted production buildings in the south and west sections of the area. At the same time, a second part of the casting facility (item 17, Figure 2) was observed in the midstage of construction, west of the older part. Continuing construction progress was observed in [REDACTED] on item 4 in the Modified Solid Propellant Plant and on buildings in the possible sulphuric acid plant.

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[redacted] of the Modified Solid Propellant Plant (Figure 4) revealed 3 possible temperature conditioning buildings (item 16), an administration building (item 2), a second L-shaped probable engineering/laboratory building (item 1), and several other buildings. The casting facility in the Double-Base Propellant Plant was complete, and an excavation was present in the nitrocellulose area. Construction was under way on a large fabrication building (item 2, Figure 6) between the possible sulphuric acid plant and the steam/power-plant, and construction activity was observed in the northeast portion of the HE/Industrial-Explosives Plant. In [redacted] construction was continuing in the area between the steam/powerplant and the HE/Industrial-Explosives Plant. At the same time a third nitroglycerine production line was under construction in the Double-Base Propellant Plant (Figure 2).

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The first larger-scale photography of the Explosives Manufacturing Plant was obtained in [redacted] and revealed that the large fabrication building (item 2, Figure 6) west of the steam/powerplant was complete, and a larger one (item 1) was in the midstage of construction in the same area. This photography also made possible the identification of the Modified Solid Propellant Plant and revealed the presence of a number of smaller buildings in this area. During the winter of 1964 and early spring of 1965, construction continued on all the uncompleted structures observed previously, but no new additions were begun.

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The excellent interpretability of the [redacted] revealed an apparent slowdown in construction; however, the large fabrication building (item 1, Figure 6) west of the steam/powerplant and a large building (item 32, Figure 2) south of the nitrocellulose area were both nearing completion. Continuing construction could be observed in the northeast portion of the HE/Industrial-Explosives Plant, and the third nitroglycerine production line was in the late stages of construction. This third line was complete in [redacted]

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Five KEYHOLE missions provided coverage of the plants during 1966; 3 were KH-4, 1 a KH-7, [redacted] Very little construction activity was evident in the Double-Base Propellant Plant; at the Modified Solid Propellant Plant 4 medium-size buildings, 1 tank, and 2 small structures were built. Construction activity was evident in the south-central part of the HE/Industrial-Explosives Plant where 3 buildings, 2 tanks, and footings for several additional structures were observed. Two probable HE nitration facilities located in the north-central part of the plant area were extensively modified during the year.

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The plant facilities were photographed by 7 KEYHOLE missions from January 1967 through June 1967: 4 KH-4, 2 KH-7, [redacted] No major new construction was observed in the Double-Base Propellant Plant or in the Modified Solid Propellant Plant. The construction in the south-central part of the Probable HE/Industrial-Explosives Plant has developed into a complex of new buildings, the majority of which were under construction in [redacted]. The rebuilding of

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the probable HE nitration facilities in the north-central section of the plant was apparently completed by June 1967.

Discussion & Evaluation

The identification of this installation as a producer of solid propellant rocket motors is based on photography and the presence of the adjacent rocket motor test facility (see Biysk, Section 1). A facility in the eastern part of the installation has been identified as a producer of double-base propellant, and another facility, designated a modified solid propellant plant, possibly produces composite modified double-base propellant. The modified solid propellant plant may also have a research and development function. Although construction activity at the site continued through 1967, it is believed that the propellant production area was sufficiently complete by mid-1963 to have supported work on solid motors. It is assumed that motor cases and nozzles are fabricated at another site and shipped into this facility for the manufacture of rocket motors.

For the following reasons, it is believed that the plant is probably involved in the KY-5/6 program: 1) rocket motors of approximately the appropriate size have been observed in the adjacent test facility, 2) the modified solid propellant plant and the test facility have the capability to manufacture and test large rocket motors, 3) the plant was operational in time to participate in the program, and 4) air traffic analysis shows a relationship between Biysk and the KY-6 firing program.

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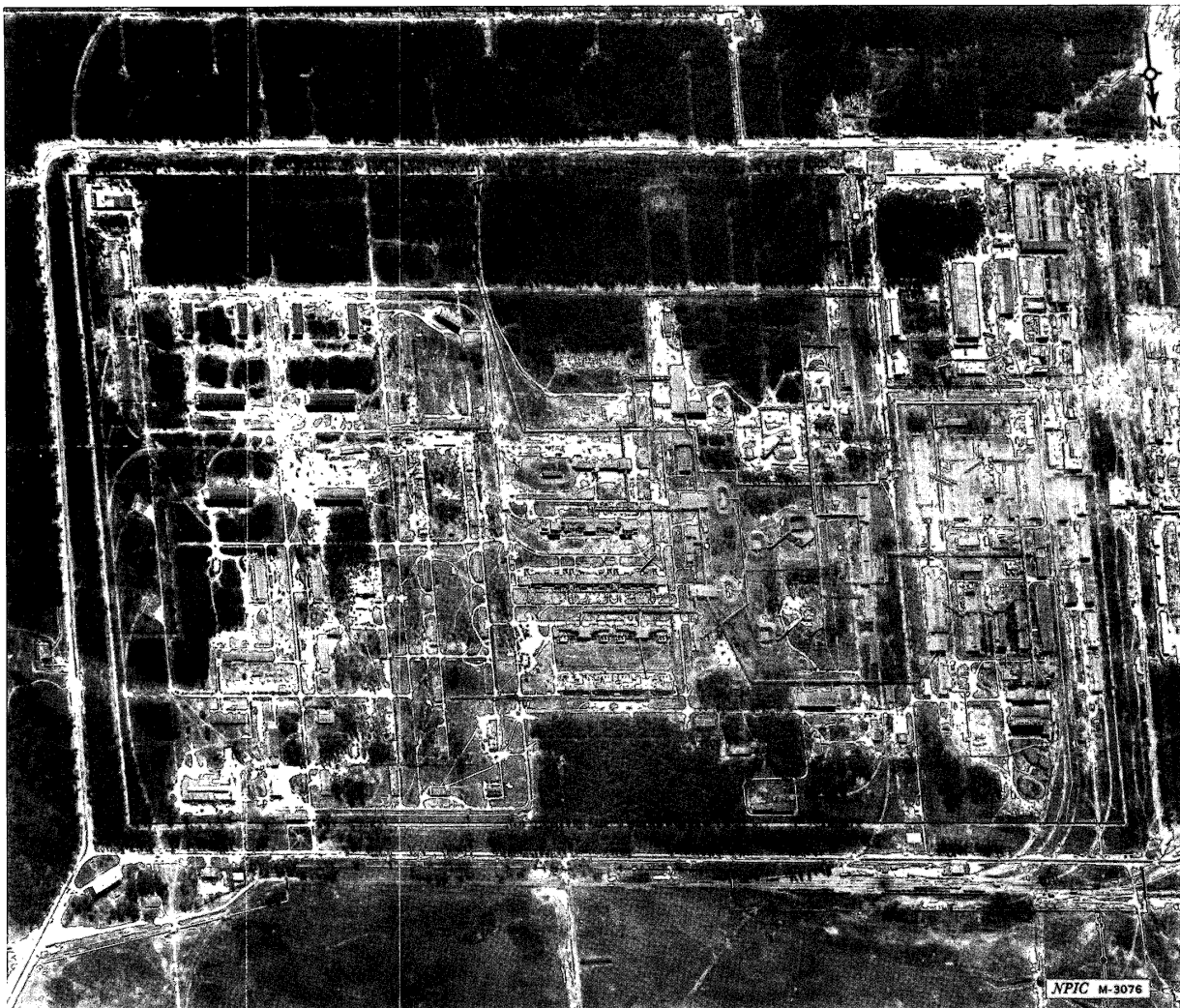


FIGURE 1. USSR: DOUBLE-BASE PROPELLANT PLANT, EXPLOSIVES MANUFACTURING PLANT AT BIYSK

Biysk 2-2

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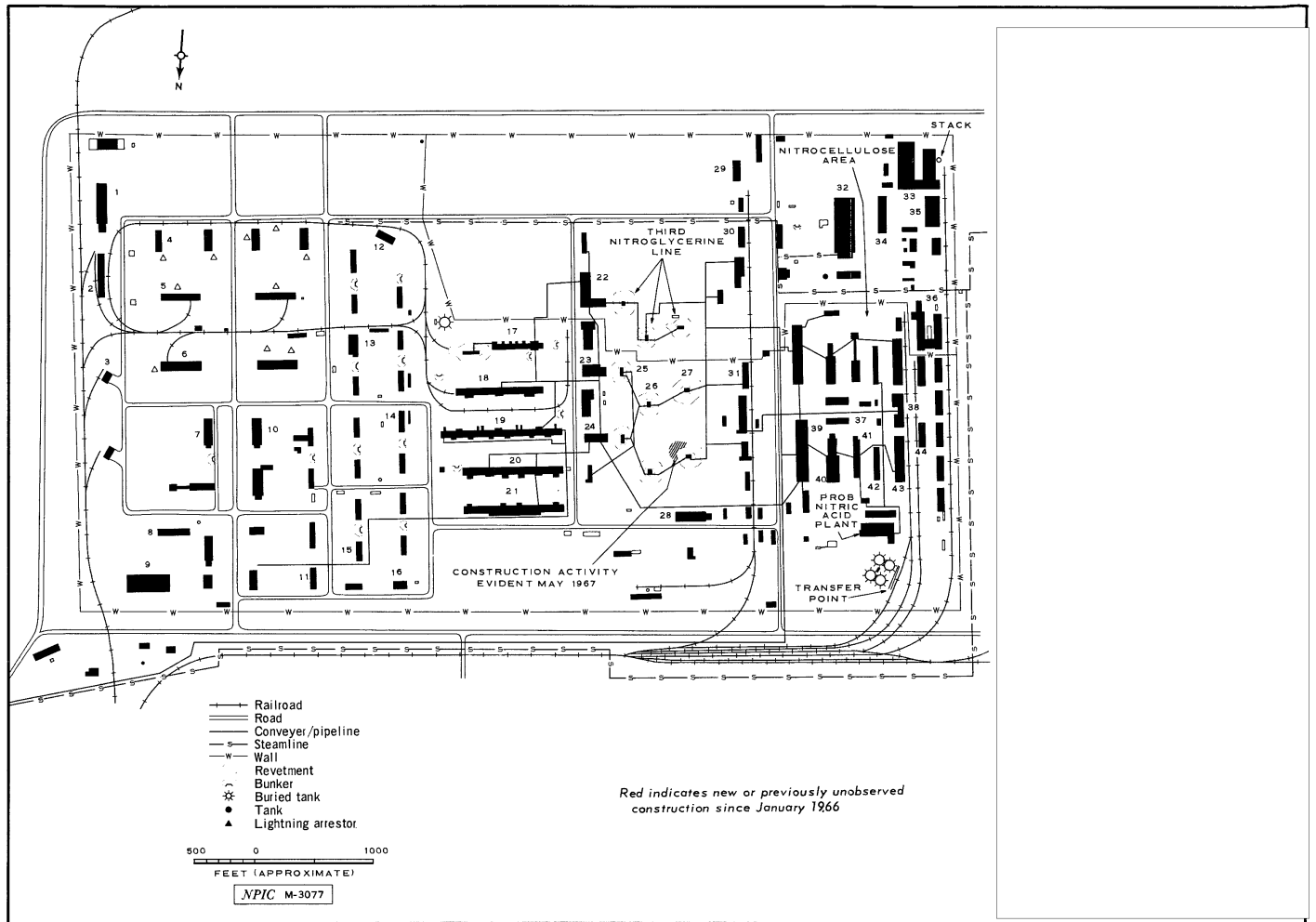


FIGURE 2. USSR: LAYOUT AND ROOF COVERAGE OF DOUBLE-BASE PROPELLANT PLANT, EXPLOSIVES MANUFACTURING PLANT AT BIYSK.

Biysk 2-3

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March 1968

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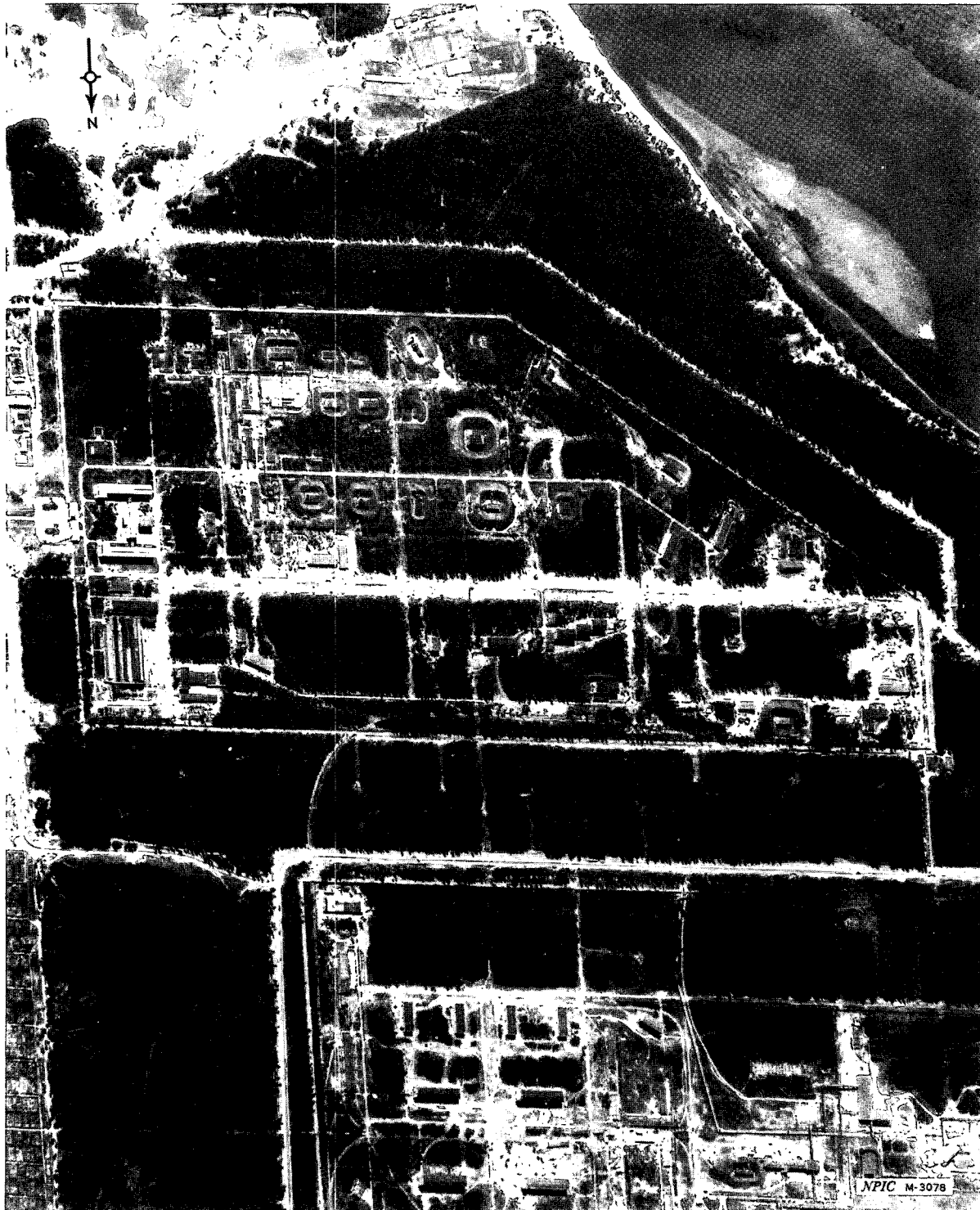


FIGURE 3. USSR: MODIFIED SOLID PROPELLANT PLANT, EXPLOSIVES MANUFACTURING PLANT AT BIYSK

Biysk 2-4

TOP SECRET

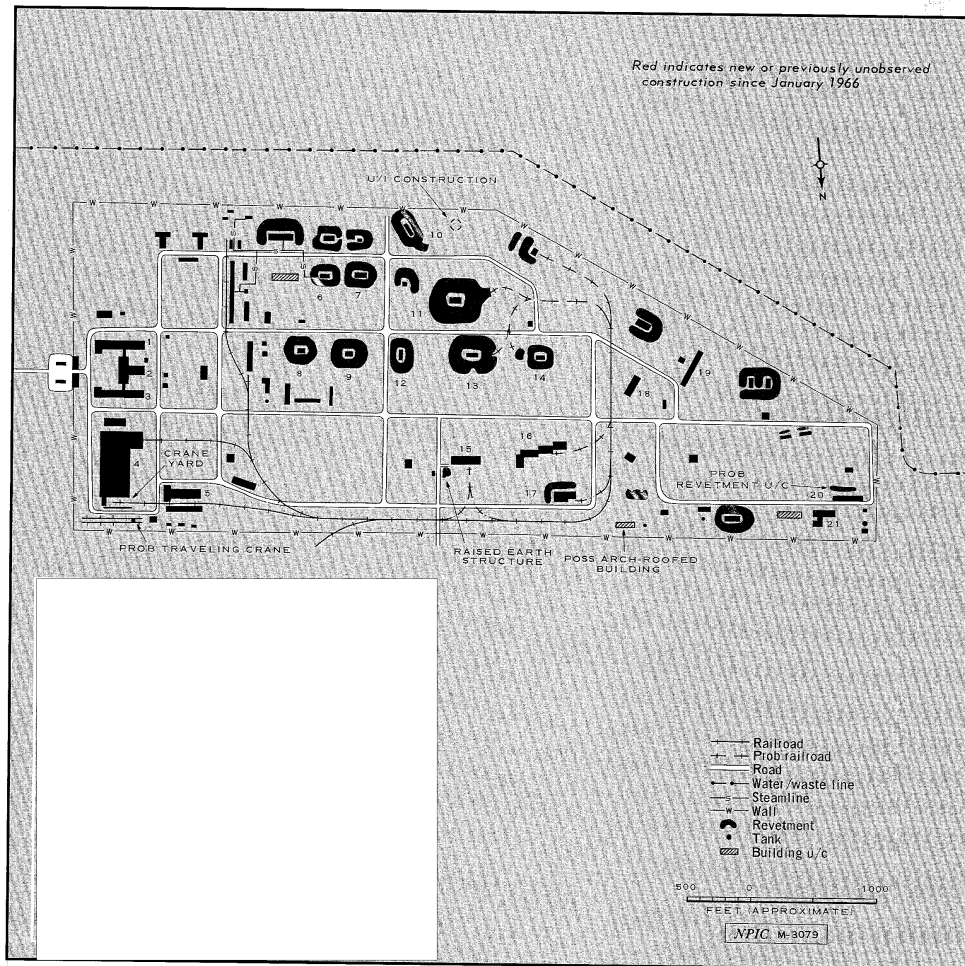
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March 1968

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25X1

FIGURE 4. USSR: LAYOUT AND ROOF COVERAGE OF MODIFIED SOLID PROPELLANT PLANT, EXPLOSIVES MANUFACTURING PLANT AT BIYSK.

Biysk 2-5

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25X1
March 1968



FIGURE 5. USSR: HIGH-EXPLOSIVES/INDUSTRIAL-EXPLOSIVES PLANT, EXPLOSIVES MANUFACTURING PLANT AT BIYSK

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Biysk 2-6

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TOP SECRET

25X1

March 1968

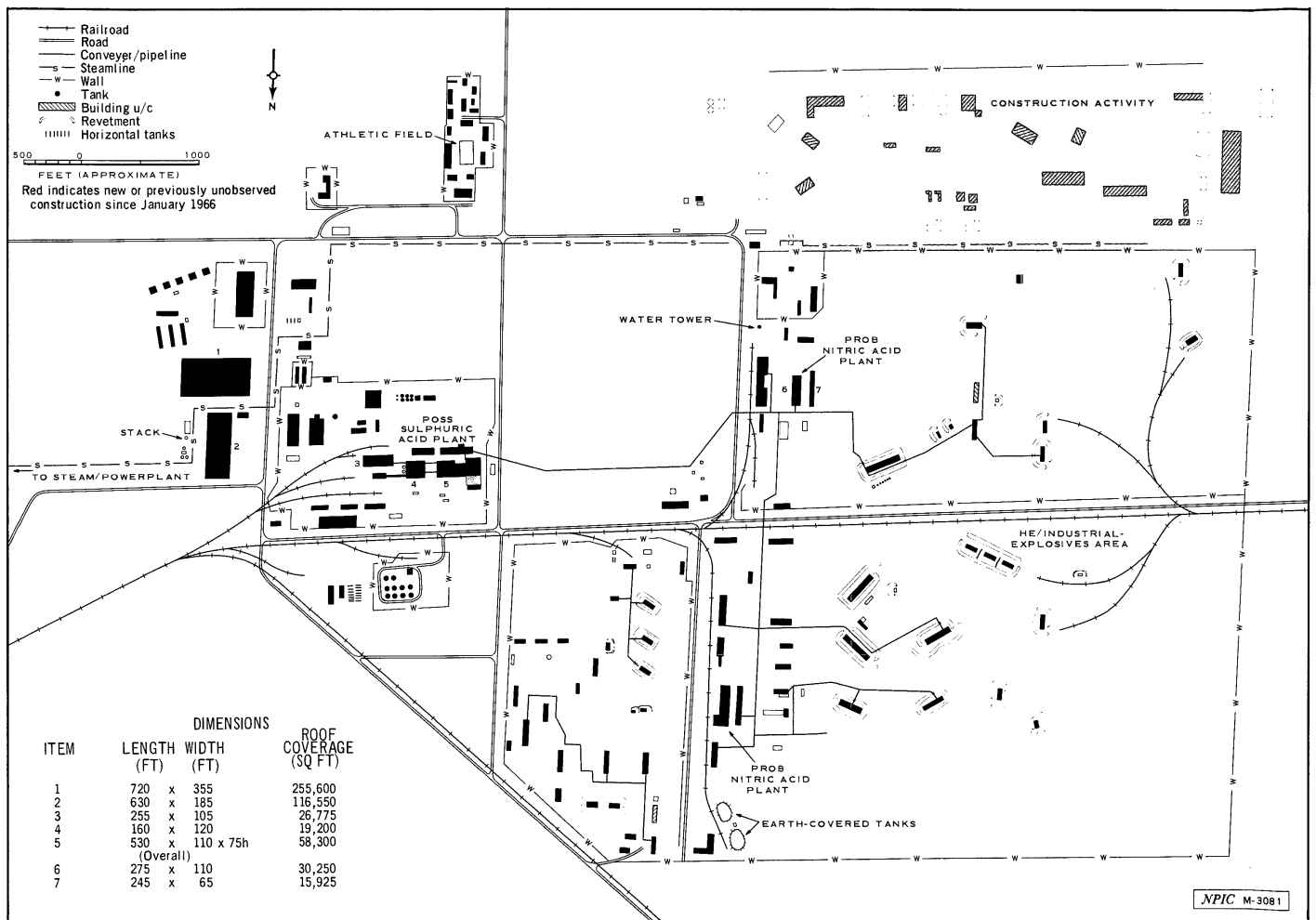


FIGURE 6. USSR: LAYOUT AND ROOF COVERAGE OF HIGH-EXPLOSIVES/INDUSTRIAL-EXPLOSIVES PLANT, EXPLOSIVES MANUFACTURING PLANT AT BIYSK.

Biysk 2-7

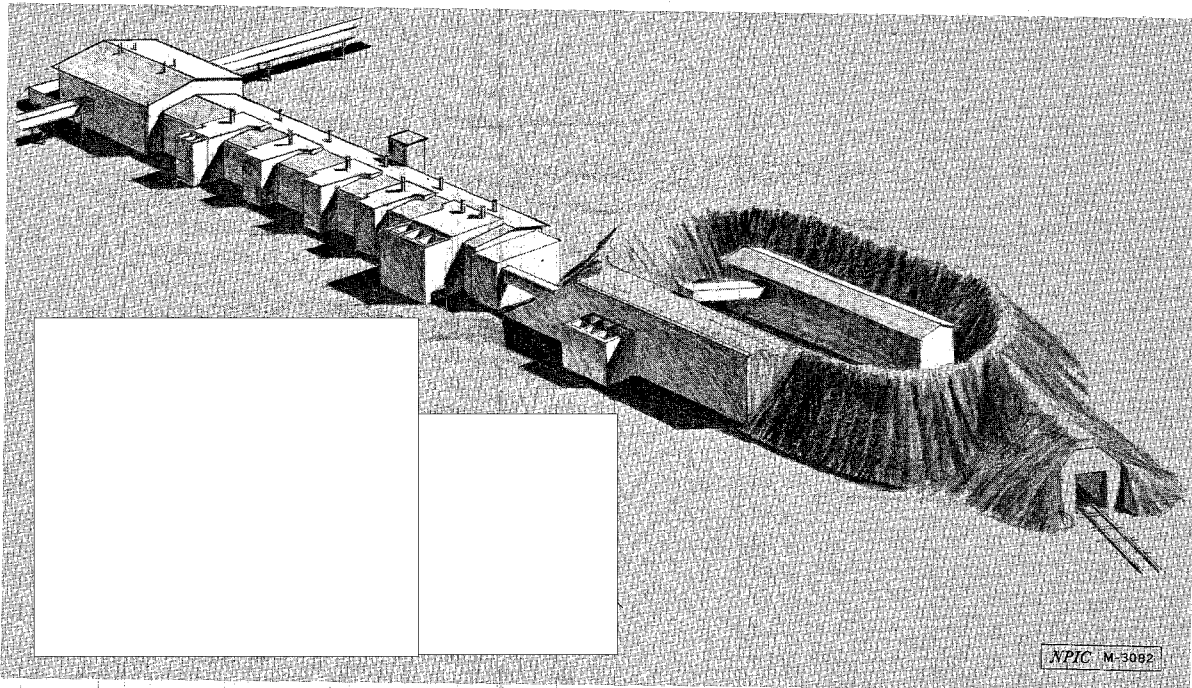
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March 1968

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25X1

25X1

FIGURE 7. USSR: PERSPECTIVE VIEW OF CASTING FACILITY (item 17, Figure 2), DOUBLE-BASE PROPELLANT PLANT, EXPLOSIVES MANUFACTURING PLANT AT BIYSK.

Biysk 2-8

TOP SECRET

25X1

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March 1968

KEMEROVO

	<u>Section</u>
City of Kemerovo	0
Solid Propellant Rocket Motor Test Facility	1
Ammunition Loading and Explosives Plant Raketa 392 (includes Solid Motor Production Plant)	2

Kemerovo 0-1

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March 1968

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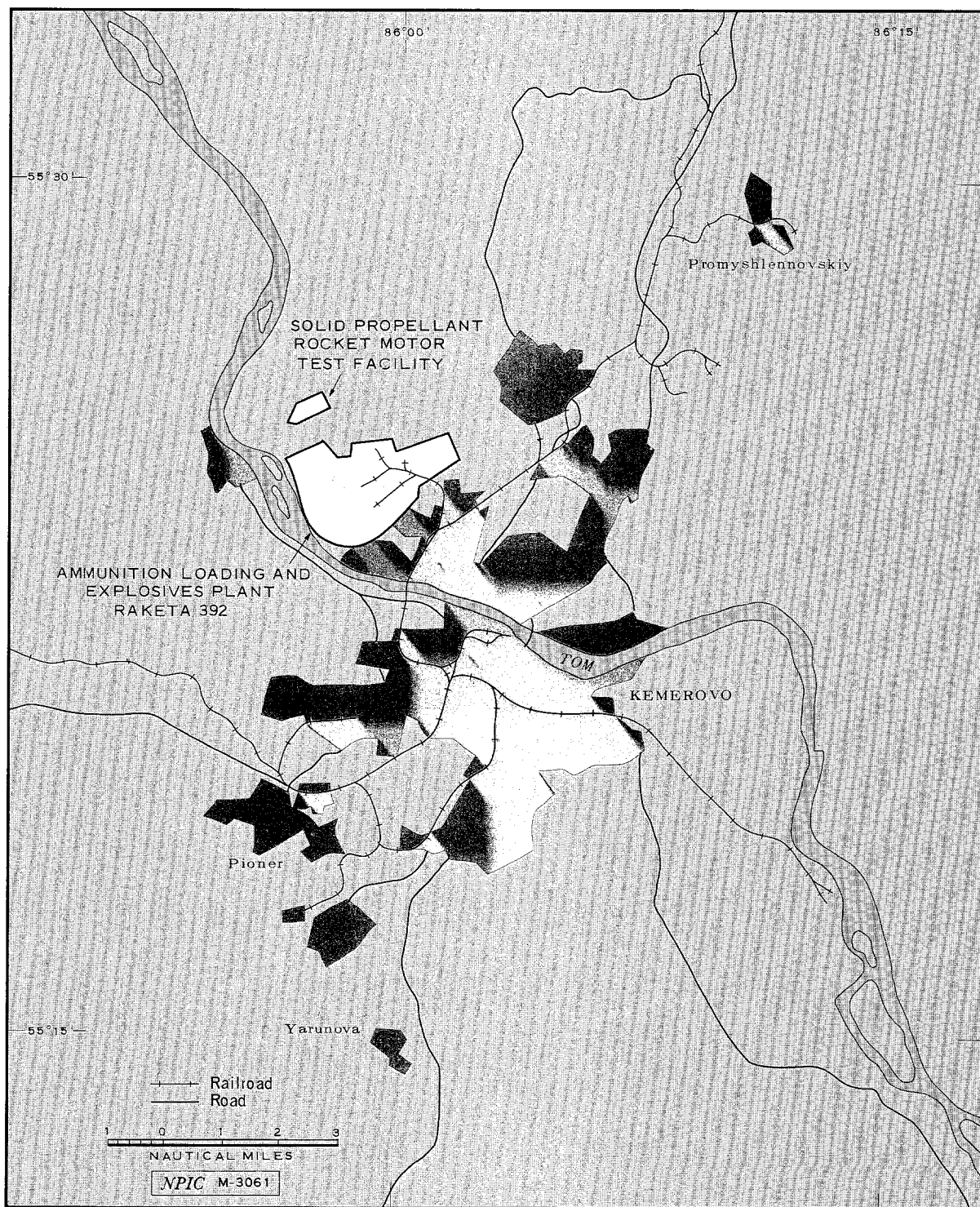


FIGURE 1. USSR: CITY OF KEMEROVO.

Kemerovo 0-2

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25X1

March 1968



FIGURE 2. USSR: CITY OF KEMEROVO

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Kemerovo 0-3

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25X1

March 1968

KEMEROVO: SOLID PROPELLANT ROCKET MOTOR TEST FACILITY

55-26-00N 085-56-50E; [REDACTED]

25X1

[REDACTED]
Tel/Ad---; PO Box---; Zone---; T/P---

25X1

Introduction

The Kemerovo Solid Propellant Rocket Motor Test Facility is located in the outskirts of Kemerovo, USSR, north-northwest of Ammunition Loading and Explosives Plant Raketa 392. The secured area contains a large horizontal test building, an L-shaped blast deflector, a possible small rocket motor test building, and various associated structures. The facility appeared to be externally complete on photography of June 1967.

Photographic Chronology

The Solid Propellant Rocket Motor Test Facility at Kemerovo was observed for the first time in the early stages of construction in [REDACTED]. At that time the east-west leg of the L-shaped revetment (item 14, Figure 2, and Figure 3) was under construction; other visible structures included a revetted building (item 10) west of the L-shaped revetment and 2 buildings under construction, both now separated from the rest of the facility by a security fence added after 1962. No KEYHOLE photography of Kemerovo was obtained between December 1962 and February 1964.

25X1

By [REDACTED] the L-shaped revetment appeared to be nearing completion, and 8 more buildings were present in various stages of construction. No significant changes had taken place by June 1964, although construction had progressed on the rail spur into the facility. The first larger-scale photography, in [REDACTED] permitted a more detailed interpretation; the security fence, steamline, and blast deflector (previously designated the L-shaped revetment) appeared to be complete. The railbeds also appeared complete, but the presence of the rails could not be determined. A possible small rocket motor test building (item 4, Figure 2, and Figure 3), served by 3 rail spurs, appeared near completion, and a large horizontal test building (item 13, Figure 2, and Figure 3) was in an early stage of construction. The presence of construction materials/pieces of equipment indicated continuing construction activity in the facility.

25X1

By [REDACTED] construction was well under way on a high-bay building (item 3) comparable to structures in the test areas at Perm and Kamensk-Shakhtinskiy (see Perm, Section 4, and Kamensk-Shakhtinskiy, Section 1). No significant changes were seen until [REDACTED] when the

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Kemerovo 1-1

25X1

TOP SECRET

TOP SECRET

March 1968

25X1
25X1

large horizontal test building and the high-bay building appeared to be in the mid-stage of construction. By [] the facility as a whole appeared to be in the late stages of construction.

25X1

The most significant structure in the facility is the large horizontal test building, which is of a different configuration from those seen at the other Soviet solid propellant facilities. The components of the test building at Kemerovo are arranged in a straight line, as opposed to the L-shaped arrangement observed at the other sites.

By [] the blast deflector had been faced with concrete slabs, and the area between the deflector and the large horizontal test cell had been completely surfaced. The test area appears externally complete, although no signs of test activity have been observed.

25X1

Discussion & Evaluation

On the basis of photography this installation has been identified as a solid propellant rocket motor test facility. It is probably utilized for the testing of motors produced at the nearby solid motor production plant (see Kemerovo, Section 2). The size and unique construction of the test facility suggest that it is capable of testing motors larger than can be tested at any of the other enclosed test facilities; however, the size of motors actually being tested cannot be determined. The facility probably became operational by the end of 1967.

Kemerovo 1-1 (Continued)

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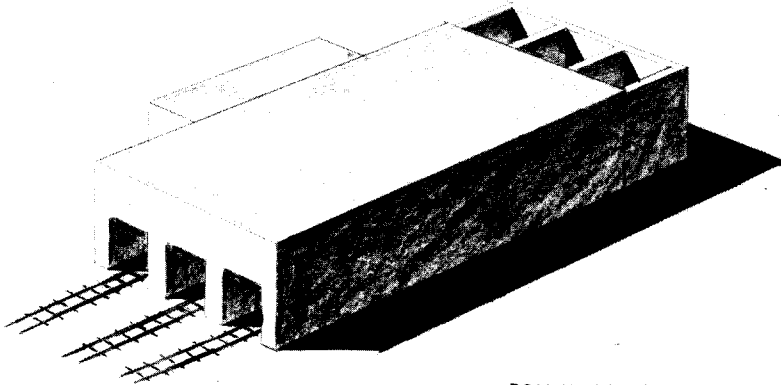
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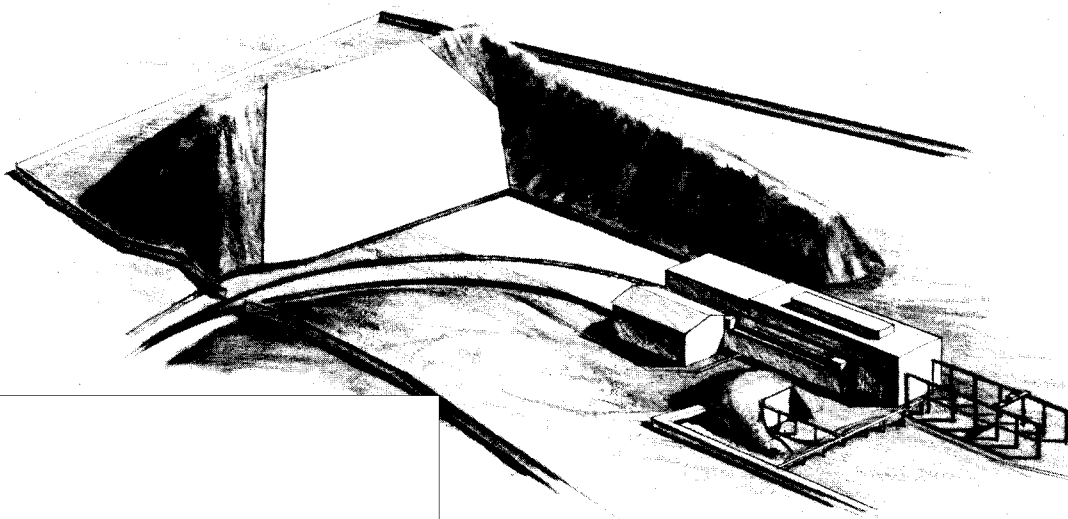
March 1968

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POSS SMALL ROCKET
MOTOR TEST BLDG (ITEM 4)



LARGE HORIZONTAL TEST BLDG (ITEM 13)
AND BLAST DEFLECTOR (ITEM 14)

NPIC M-3065

FIGURE 3. USSR: PERSPECTIVE VIEWS OF TEST STRUCTURES IN THE SOLID PROPELLANT ROCKET
MOTOR TEST FACILITY AT KEMEROVO. (Item numbers are keyed to Figure 2).

Kemerovo 1-4

TOP SECRET

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March 1968

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25X1

KEMEROVO: AMMUNITION LOADING AND EXPLOSIVES PLANT RAKETA 392

55-24-08N 085-59-00E; [REDACTED]

25X1

Tel/Ad VYuGA; PO Box 120; Zone 1; T/P---

25X1

SOLID MOTOR PRODUCTION PLANT

55-26-00N 085-57-25E; [REDACTED]

25X1

Introduction

Ammunition Loading and Explosives Plant Raketa 392 is located on the north bank of the Tom River in the outskirts of Kemerovo, USSR. The older section of the plant, the area for the manufacture of single-base solid propellant and possibly polymers (Figures 1 and 2), was essentially complete when first observed. The area for the production of advanced solid propellant (Figures 3, 4, and 5) was under construction when first observed; in the following chronology, all item numbers refer to Figure 4. The most recent photography of the Kemerovo installations was obtained in September 1967.

Photographic Chronology

The Kemerovo Ammunition Loading and Explosives Plant Raketa 392 was first observed on KEYHOLE photography of [REDACTED]. The facility at that time consisted of an explosives and munitions plant with capabilities for manufacturing high-energy industrial explosives, nitrocellulose, and single-base smokeless powder. The Advanced Solid Propellant Production Facility was then in the very early stages of construction; although this photography was of only fair interpretability, it did permit observation of 6 complete buildings (items 10, 15-18, and 30) and 6 buildings under construction. No other signs of building construction were visible, and no indications of rail spurs or security fences were evident.

25X1

Photography of the Advanced Solid Propellant Facility was obtained 5 times during 1962. Construction was proceeding at a fairly rapid pace; a total of 15 more structures had been completed, and construction had begun on 2 other buildings. Railbed construction had been started by [REDACTED] and preliminary security fences were visible.

25X1

No usable KEYHOLE photography of Kemerovo was obtained between December 1962 and February 1964. The number of buildings that were first observed and appeared complete in [REDACTED] indicated that construction had

25X1

Kemerovo 2-1

TOP SECRET

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TOP SECRET

March 1968

25X1
25X1

continued steadily during the 14-month interval. Eight buildings appeared complete when they were first observed in February, and 8 more buildings were completed during the balance of 1964. In February the facility appeared to be approaching an operational status; security fences, rail spurs, steamlines, and possible water lines were apparently nearing completion.

Two additional support buildings were first observed in [] and were complete by []. A possible motor case inspection/storage building (item 28) was either removed or destroyed between []; an incident of this type could indicate that the plant was then in operation. A similar occurrence took place at Kamensk-Shakhtinskiy, where a blend/mix building was completely destroyed in 1965 and later rebuilt.

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25X1
25X1

The first larger-scale, stereo photography of Kemerovo in almost 2 years was obtained in [] permitting the confirmation of completed rail spurs and steamlines. During the late summer of 1966 [] a possible rocket motor case measuring [] was observed near Building 25, and 2 rail cars/motor dollies were seen on the spurs entering the curing buildings; 1 car/dolly measuring [] was seen near Building 17, and another measuring [] was visible outside Building 15. Because of its greater height, Building 15 is possibly used for larger motors. The presence of rail cars/dollies and a possible rocket motor case may indicate that production had begun by the fall of 1966.

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Between [] a blend/mix building (item 21) was partially destroyed either by fire or explosion. Portions of the framework, service conveyors, and pipelines still remain. Photography of [] revealed that this structure had been replaced. An earthen revetment/barricade has been constructed around the service building for Building 22.

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25X1

Discussion & Evaluation

The identification of this complex as a producer of solid propellant and rocket motors is based on photography, COMINT and collateral information, and the presence of the nearby solid propellant rocket motor test facility (see Kemerovo, Section 1). The complex includes 2 propellant manufacturing sections. The older manufactures explosives and single-base propellants; it also has a possible polymer production plant which may produce binders for composite propellants.

The newer section, which is similar in appearance to the propellant manufacturing facilities at Kamensk-Shakhtinskiy and Perm (see Kamensk-Shakhtinskiy, Section 2, and Perm, Section 5), is thought to be producing a more advanced solid propellant, probably a composite type. This plant appeared to have been sufficiently

Kemerovo 2-1 (Continued)

TOP SECRET

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TOP SECRET

March 1968

completed by the end of 1964 to initiate operations. The first indications of production activity there were the removal or destruction of a possible motor case inspection/storage building between May and July 1965 and the presence of rail cars/dollies and a possible rocket motor case in August 1966. It is assumed that motor cases and nozzles are fabricated at another site and shipped to the plant for the manufacture of rocket motors.

Kemerovo 2-1 (Continued)

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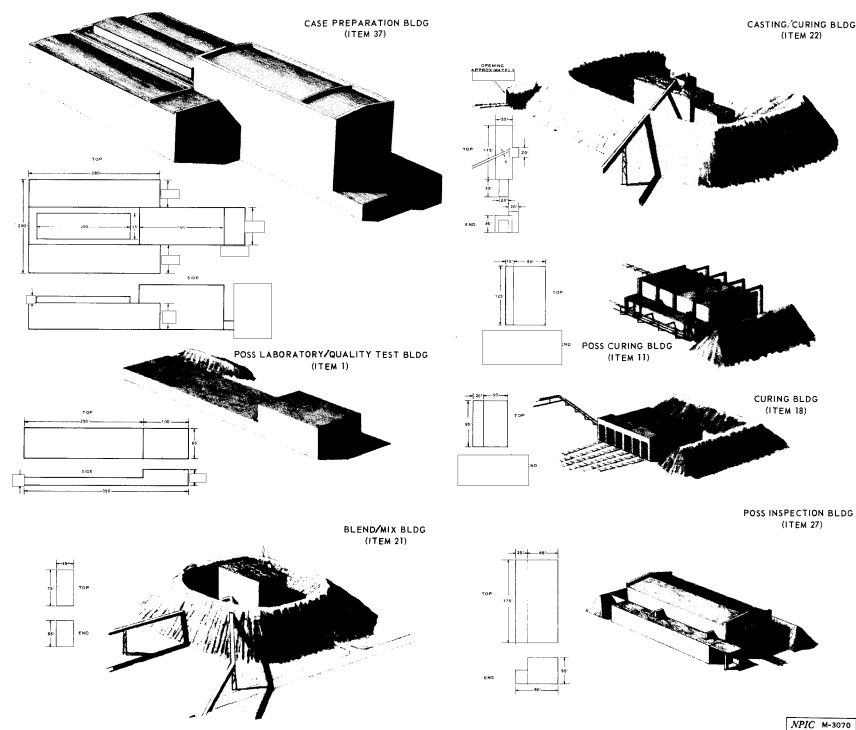
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March 1968

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FIGURE 5. USSR: PERSPECTIVE VIEWS OF SELECTED STRUCTURES IN THE ADVANCED SOLID PROPELLANT PRODUCTION FACILITY AT KEMEROVO. (Item numbers are keyed to Figure 4).

Kemerovo 2-6

TOP SECRET

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TOP SECRET

March 1968

25X1
25X1**KRASNOYARSK**

	<u>Section</u>
City of Krasnoyarsk	0
Armaments Plant 4	1
Rocket Engine Test Facility	2
Solid Propellant Rocket Motor Test Facility	3
Explosives Plant Zlobino 580 (includes Solid Motor Production Plant)	4

Krasnoyarsk 0-1

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March 1968

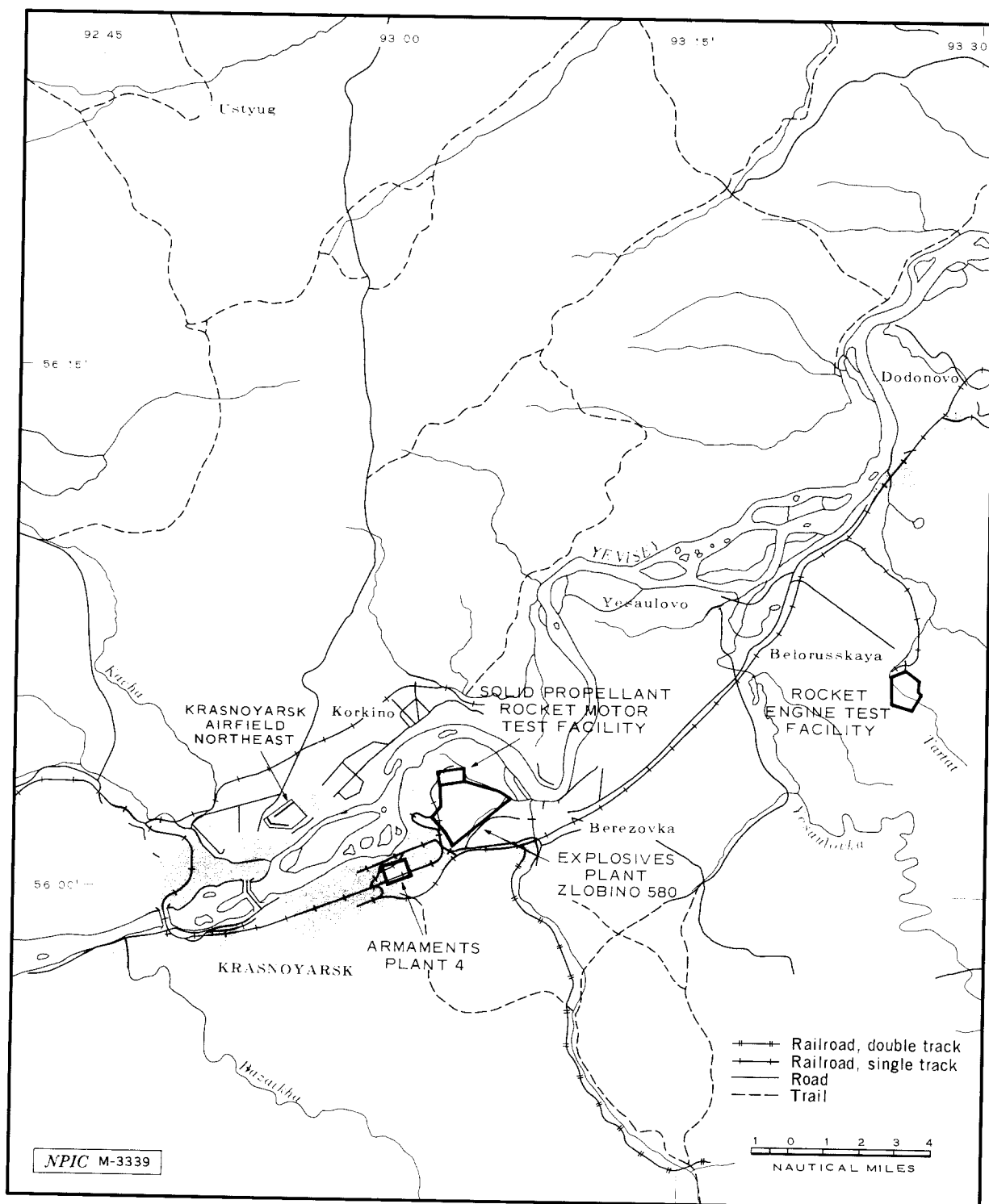


FIGURE 1. USSR: CITY OF KRASNOYARSK.

Krasnoyarsk 0-2

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March 1968

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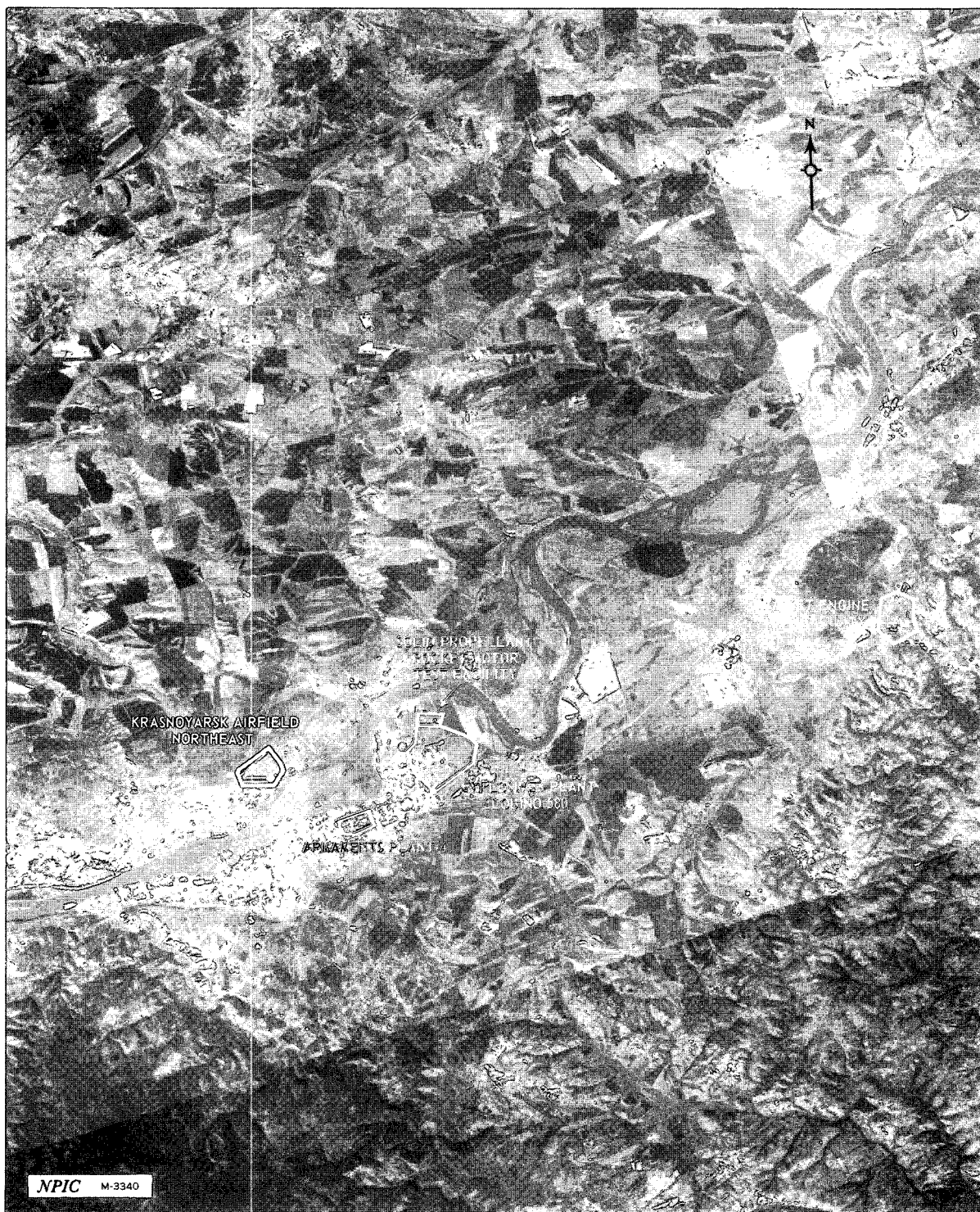


FIGURE 2. USSR: CITY OF KRASNOYARSK

25X1

Krasnoyarsk 0-3

25X1

TOP SECRET

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March 1968

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25X1



FIGURE 1. USSR: SOLID PROPELLANT ROCKET MOTOR TEST FACILITY AT KRASNOYARSK

Krasnoyarsk 3-2

TOP SECRET

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25X1

25X1

TOP SECRET

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March 1968

when a probable motor storage building (item 13) was observed with a similar structure under construction nearby.

Discussion & Evaluation

On the basis of photographic evidence this installation has been identified as a solid propellant rocket motor test facility. It is probably utilized for the testing of motors produced at the adjacent solid motor production plant (see Section 4). The test facility probably became operational by the end of 1964.

Krasnoyarsk 3-1 (Continued)

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TOP SECRET

March 1968

25X1
25X1**KRASNOYARSK: SOLID PROPELLANT ROCKET MOTOR TEST FACILITY**

56-04-01N 093-03-25E; [REDACTED]

25X1

25X1

Tel/Ad ---; PO Box ---; Zone ---; T/P ---

Introduction

The Solid Propellant Rocket Motor Test Facility is located in the eastern outskirts of Krasnoyarsk, USSR, on the northern edge of Explosives Plant Zlobino 580 (see Section 4); the test facility serves the plant which includes among its products double-base, and probably single-base, propellants. The separately secured test facility includes two test cells, a checkout-assembly building, a components/batch test building, and various support and storage structures. Two groups of offset buildings, used for temperature conditioning/curing, are located between the test facility and the double-base propellant plant. This chronology includes photography obtained in February 1967.

Photographic Chronology

Although it cannot be precisely determined when construction of the Krasnoyarsk Solid Propellant Rocket Motor Test Facility began, it appeared to be in an early or mid-stage of construction when first seen on KEYHOLE photography in [REDACTED]

[REDACTED] At that time the blast deflector of Test Cell 2 (item 2, Figure 2) was complete and its cell building was under construction, two wings of the H-shaped building (item 6) were complete, and three support buildings were present. By [REDACTED] Test Cell 2 had been completed, and four sections of the H-shaped building could be discerned.

[REDACTED] revealed that Test Cell 1 and the H-shaped building had been completed and another support building had been added. No changes were observed in [REDACTED] the facility appeared to be essentially complete in [REDACTED] No further photographic coverage was obtained until [REDACTED] when an additional support building was identified. [REDACTED] revealed a group of three offset buildings (item 11), and a second group of these structures (item 12) was seen in [REDACTED]. The second group was nearly complete in [REDACTED] when one, possibly two, revetted buildings and two other small structures were observed outside the security wall around the site. By [REDACTED] both groups of offset buildings were apparently complete, and a possible steamline serving both groups was visible.

No further major changes were observed until [REDACTED]

Krasnoyarsk 3-1

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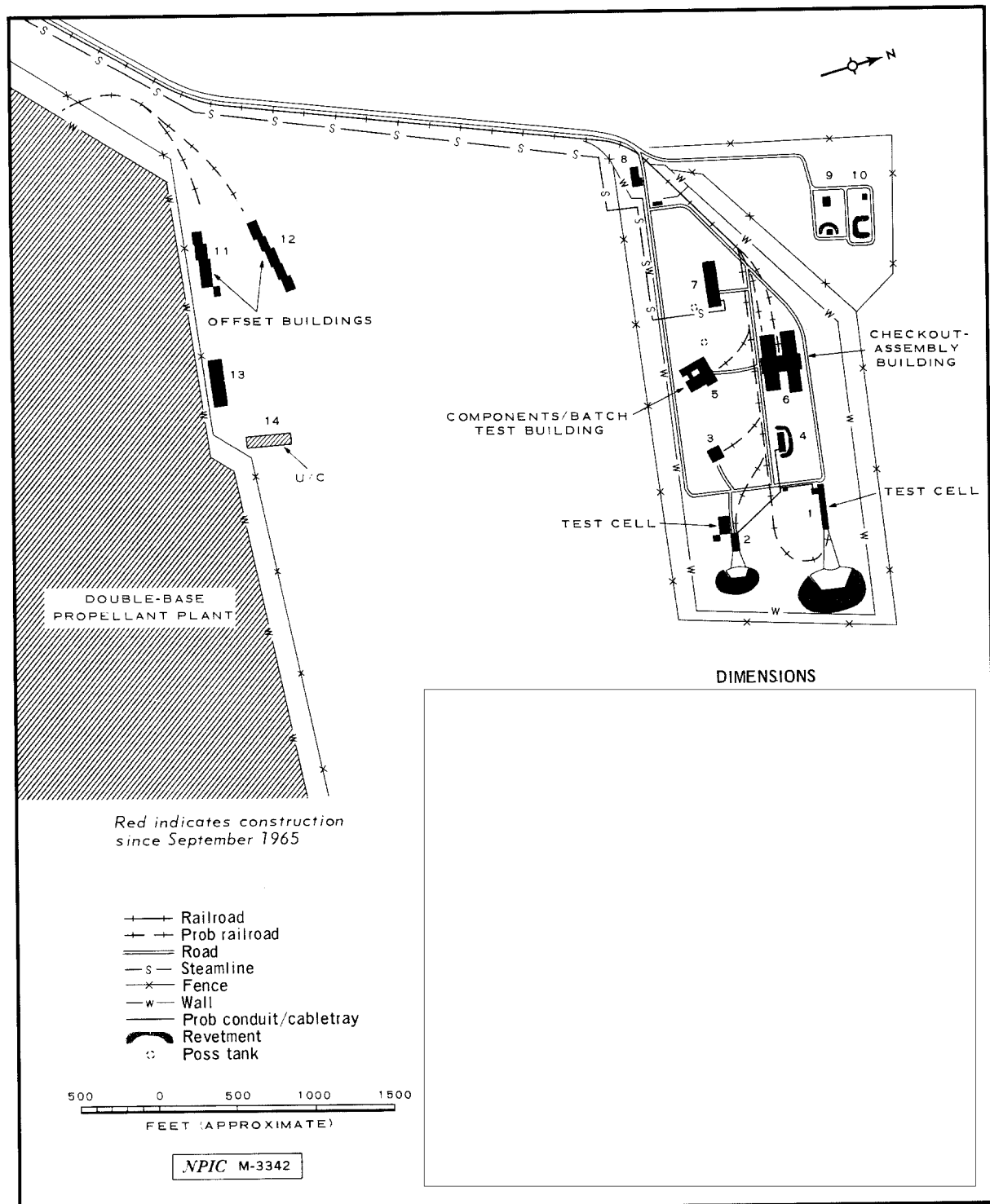


FIGURE 2. USSR: LAYOUT AND ROOF COVERAGE OF SOLID PROPELLANT ROCKET MOTOR TEST FACILITY AT KRASNOYARSK.

Krasnoyarsk 3-3

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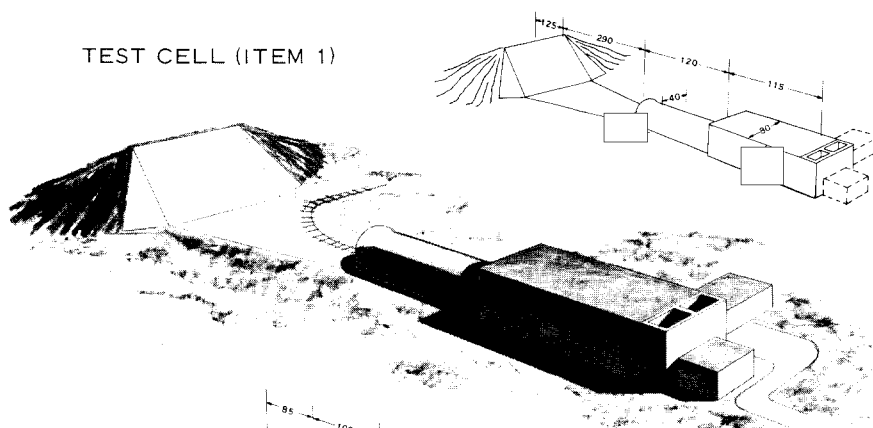
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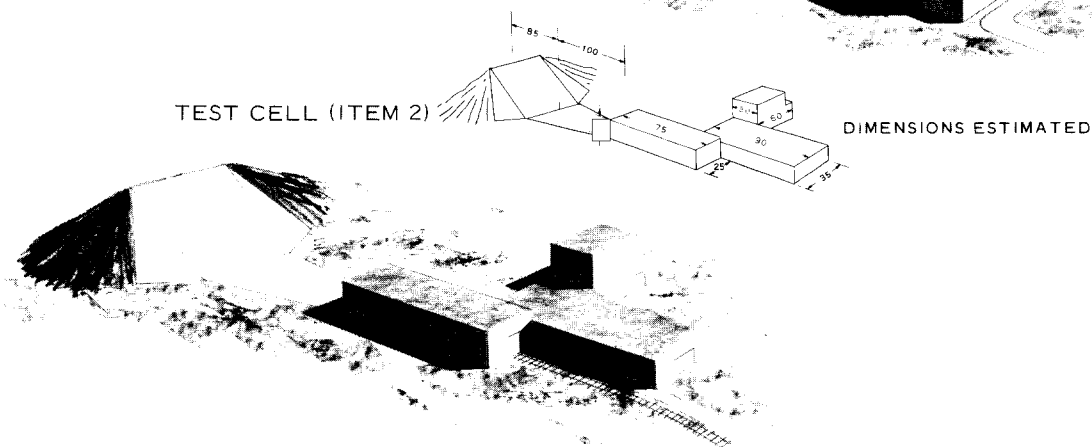
March 1968

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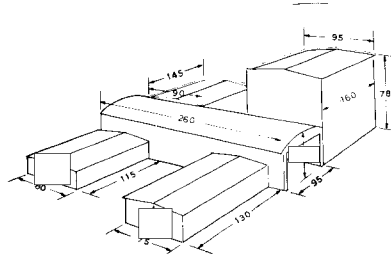
TEST CELL (ITEM 1)

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25X1

TEST CELL (ITEM 2)



25X1



CHECKOUT-ASSEMBLY BUILDING (ITEM 6)

NPIC M-3343

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25X1

FIGURE 3. USSR: PERSPECTIVE VIEWS OF SIGNIFICANT STRUCTURES AT SOLID PROPELLANT ROCKET MOTOR TEST FACILITY AT KRASNOYARSK. Item numbers are keyed to Figure 2.

Krasnoyarsk 3-4

TOP SECRET

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25X1
25X1**KRASNOYARSK: EXPLOSIVES PLANT ZLOBINO 580**

56-02-28N 093-03-03E; [REDACTED]

25X1

Tel/Ad TAJGA; PO Box 33; Zone 4; T/P ---

25X1

SOLID MOTOR PRODUCTION PLANT

56-03-42N 093-02-53E; [REDACTED]

25X1

Introduction

Explosives Plant Zlobino 580 is located in the eastern outskirts of Krasnoyarsk, USSR. Facilities of the complex include a double-base propellant plant (Figures 1 and 2), a probable single-base propellant plant (Figures 3 and 4), a munitions storage area (also shown in Figures 3 and 4), and a rocket motor test facility (see Section 3). The area of the double-base plant incorporates motor casting and storage facilities, as well as a shell-testing range. Two groups of offset buildings, used for temperature conditioning/curing, are located between the double-base plant and the test facility. The most recent photography used in this chronology was obtained in February 1967.

Photographic Chronology

Plant 580 was first seen in June 1961 on KEYHOLE photography of poor interpretability [REDACTED]. At that time the plant contained the components necessary for the production of conventional double-base propellants; the area later identified as a solid propellant production area was then in the early stages or earth-excavation phase of construction. The only building observed in the immediate vicinity (item 8, Figure 2) was just east of two older double-base propellant blending and mixing buildings.

25X1

Photography of [REDACTED] revealed that construction was proceeding on eight buildings (including items 4, 9, and 10). Item 10, later identified as part of a casting facility, was in the early stages of construction. Both parts of this facility appeared complete by [REDACTED] however, revetting of the smaller north structure had not yet started. The June 1962 photography also revealed that Building 17 and two nearby buildings had been added. The revetting at Building 10 was in progress in [REDACTED], and structural members for a second casting facility (item 11) were in place.

25X1

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Construction at the plant continued during [REDACTED] both casting facilities appeared complete, although the smaller component of Building 11 was only partially revetted. Also observed on the December photography

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Krasnoyarsk 4-1

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TOP SECRET

March 1968

25X1

25X1

was a new building (item 3) near the offset buildings (see Section 3) but inside the plant wall. Photography of [] revealed new construction at the eastern edge of the plant (item 13 and adjacent building).

25X1

Changes observed in [] included a small new building immediately north of the shell-testing range and a building excavation just west of it. A third production line was under construction in the nitroglycerine area, and a possible industrial waste disposal plant was under construction west of the explosives plant.

25X1

No photography of good interpretability was obtained in 1966. By [] [] the new nitroglycerine line appeared complete. Two support-type buildings under construction in 1965 on the west side of the plant were also complete. A new small support-type building was visible immediately west-southwest of the shell-testing range, and little change could be seen in the status of the building excavation west of the range.

25X1

25X1

Discussion & Evaluation

The identification of this complex as a producer of solid propellant and rocket motors is based on photography and the presence of the adjacent rocket motor test facility (see Section 3). The complex is believed to manufacture single- and double-base propellants and explosives. The presence of a shell-testing range and rolling/extrusion facilities and the absence of revetting except at the nitroglycerine lines and casting facilities suggest that the complex produces small rocket motors and munitions. Although construction activity has continued through 1967, it is believed that the double-base facilities were sufficiently complete in mid-1962 to have supported initial developmental work on solid motors. It is assumed that motor cases and nozzles are fabricated at another site and shipped to this facility for the manufacture of rocket motors.

Krasnoyarsk 4-1 (Continued)

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TOP SECRET

March 1968

25X1



FIGURE 1. USSR: DOUBLE-BASE PROPELLANT PLANT, EXPLOSIVES PLANT ZLOBINO 580 AT KRASNOYARSK

Krasnoyarsk 4-2

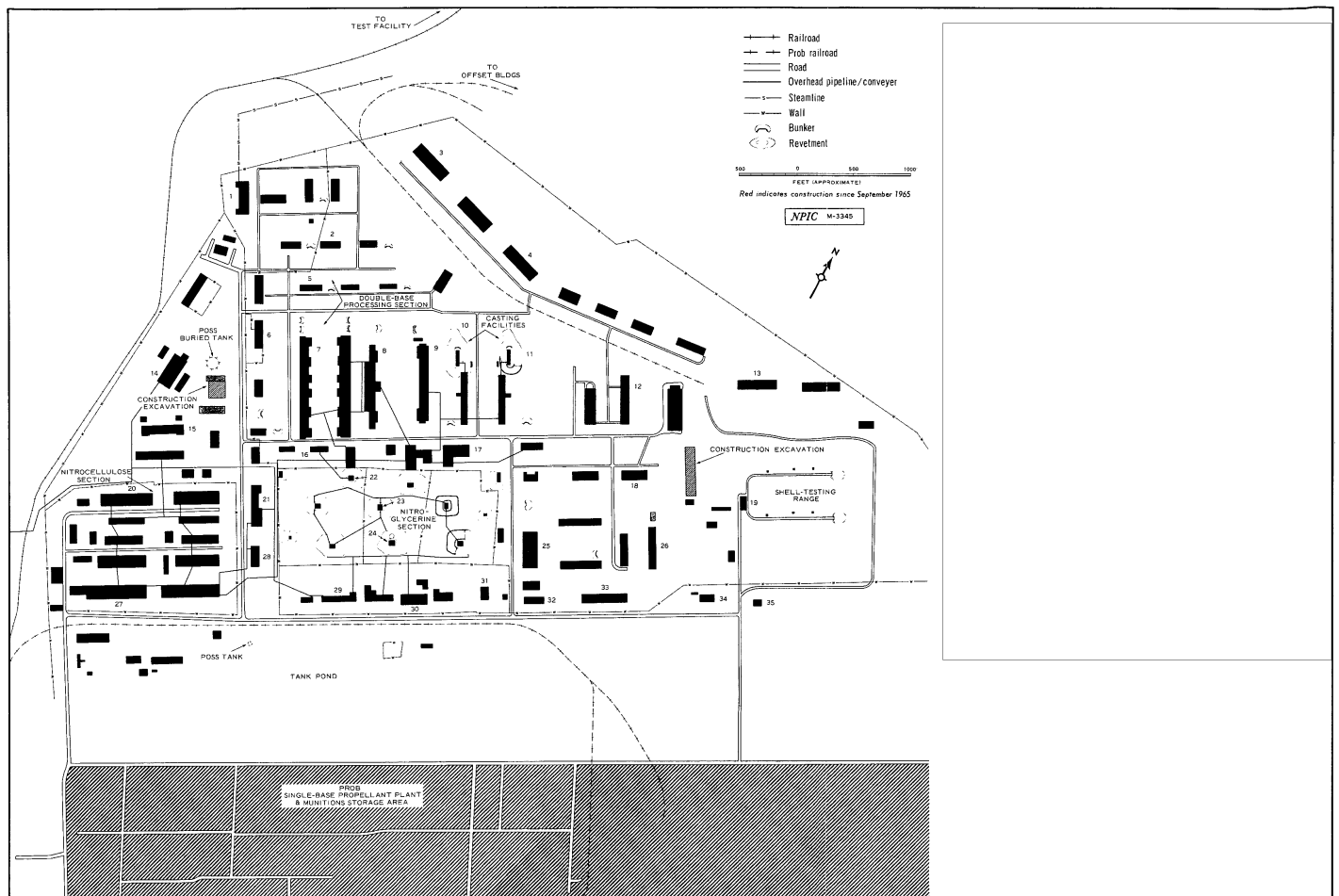
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March 1968



Krasnoyarsk 4-3

TOP SECRET

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TOP SECRET

March 1968

25X1



FIGURE 3. USSR: PROBABLE SINGLE-BASE PROPELLANT PLANT AND MUNITIONS STORAGE AREA, EXPLOSIVES PLANT ZLOBINO 580 AT KRASNOYARSK

Krasnoyarsk 4-4

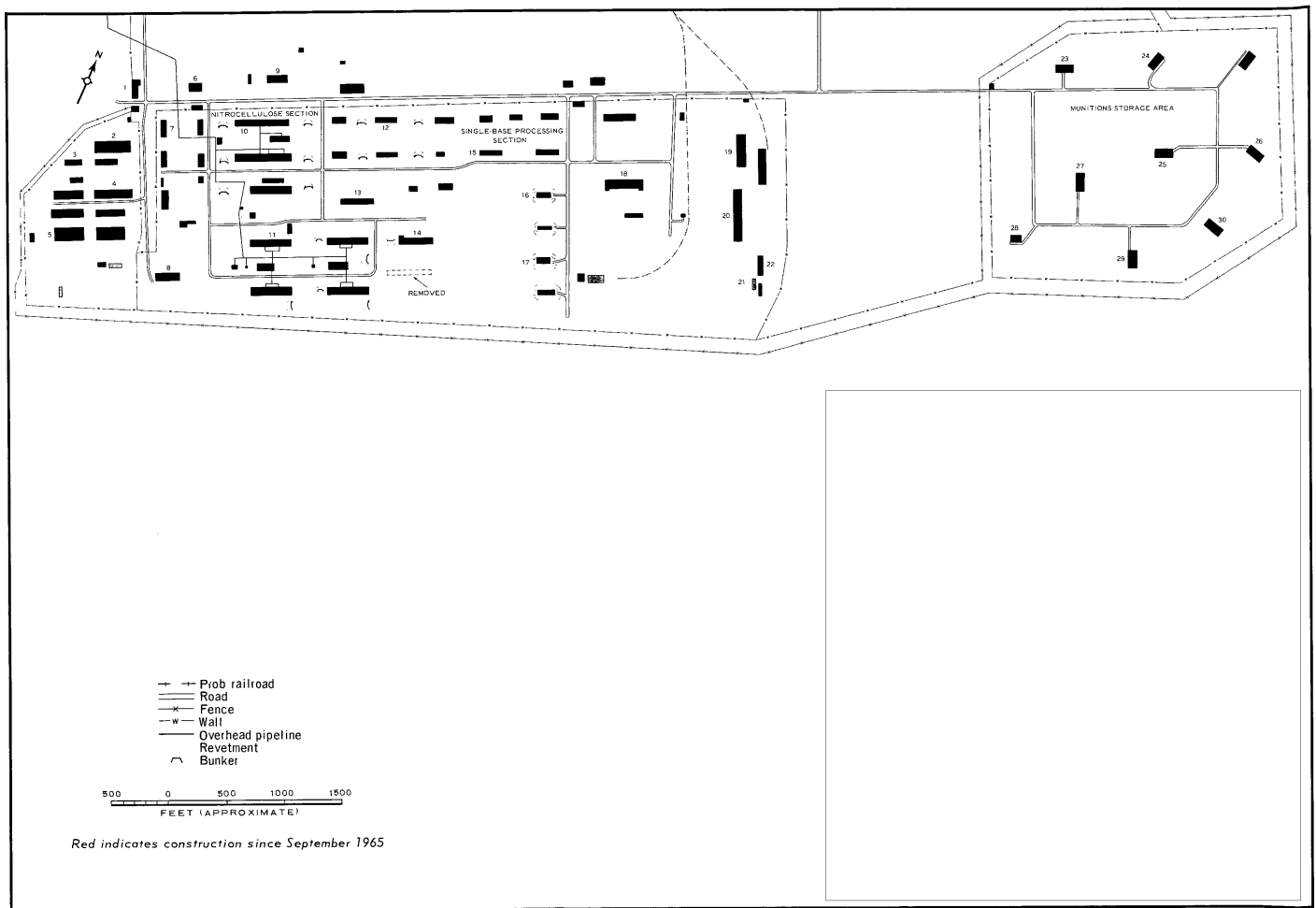
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25X1

FIGURE 4. USSR: LAYOUT AND ROOF COVERAGE OF PROBABLE SINGLE-BASE PROPELLANT PLANT AND MUNITIONS STORAGE AREA, EXPLOSIVES PLANT ZLOBINO 580 AT KRASNOYARSK.

Krasnoyarsk 4-5

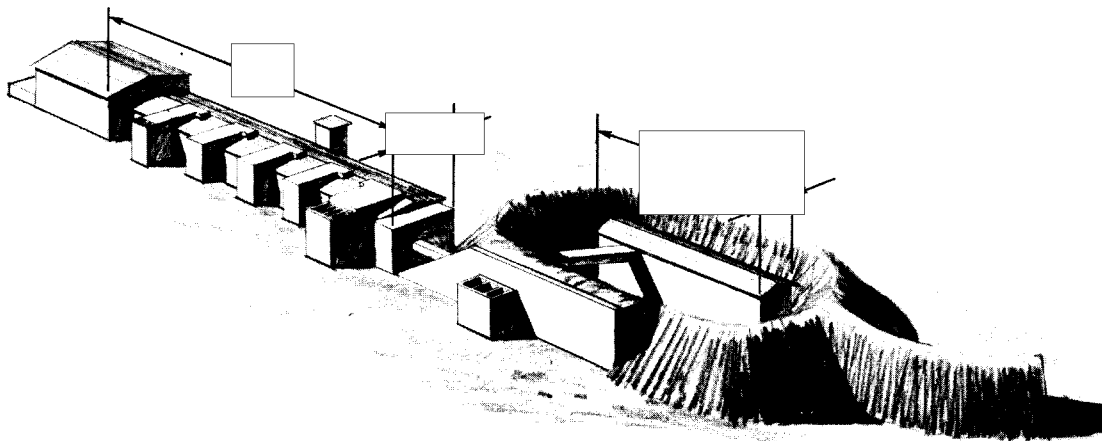
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March 1968

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ALL DIMENSIONS EXPRESSED IN FEET

NPIC M-3348

FIGURE 5. USSR: CASTING FACILITY (item 10, Figure 2), DOUBLE-BASE PROPELLANT PLANT, EXPLOSIVES PLANT ZLOBINO 580 AT KRASNOYARSK. Item 11 is a similar casting facility.

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25X1

Krasnoyarsk 4-6

TOP SECRET

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TOP SECRET

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March 1968

LENINGRAD

	<u>Section</u>
City of Leningrad	0
Armaments Plant 232	1
Solid Propellant Rocket Motor Test Facilities (includes Test Facilities 1, 2, and 3)	2
Probable Rocket Motor R&D Plant Petrokrepost	3

Leningrad 0-1

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March 1968

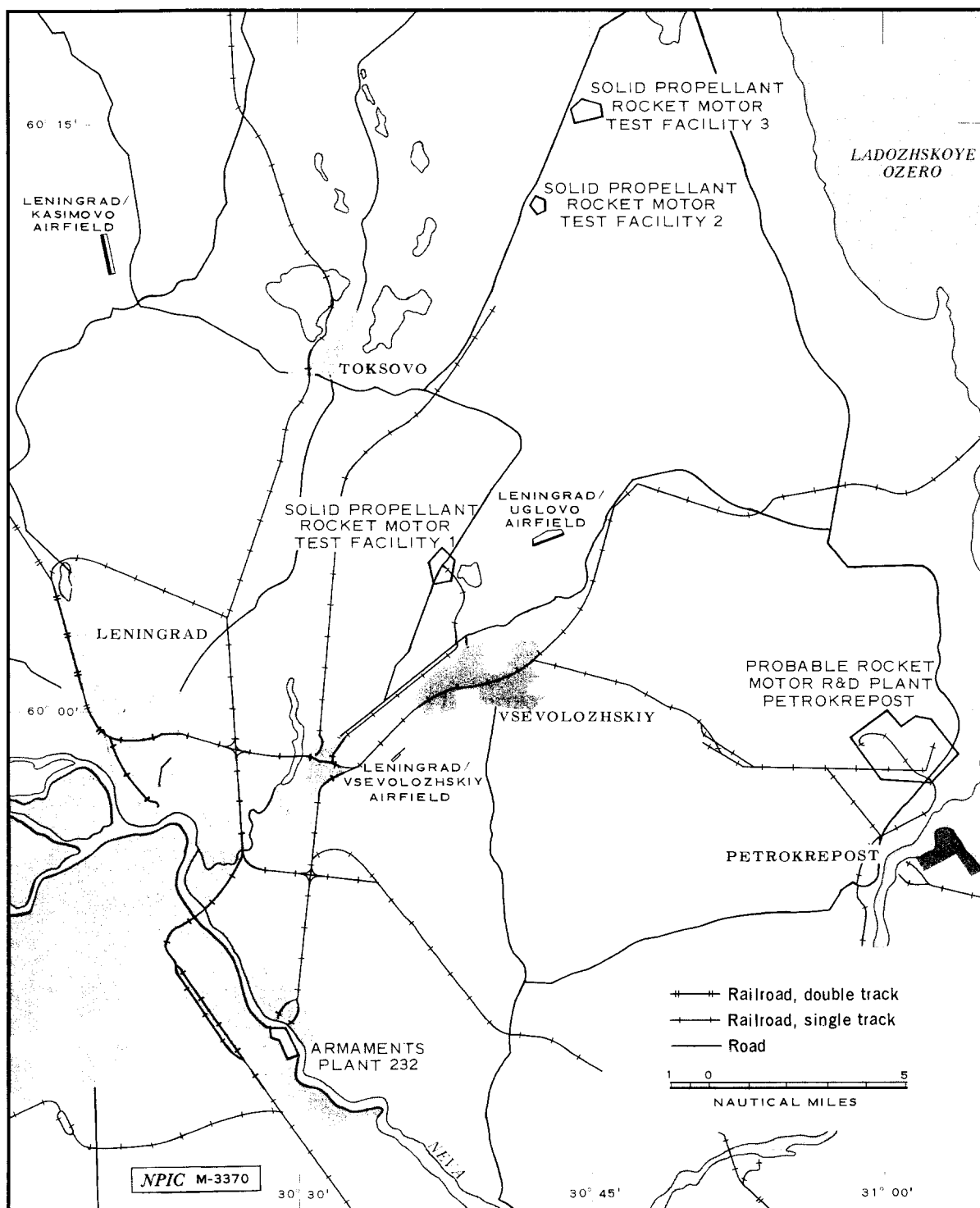


FIGURE 1. USSR: CITY OF LENINGRAD.

Leningrad 0-2

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March 1968

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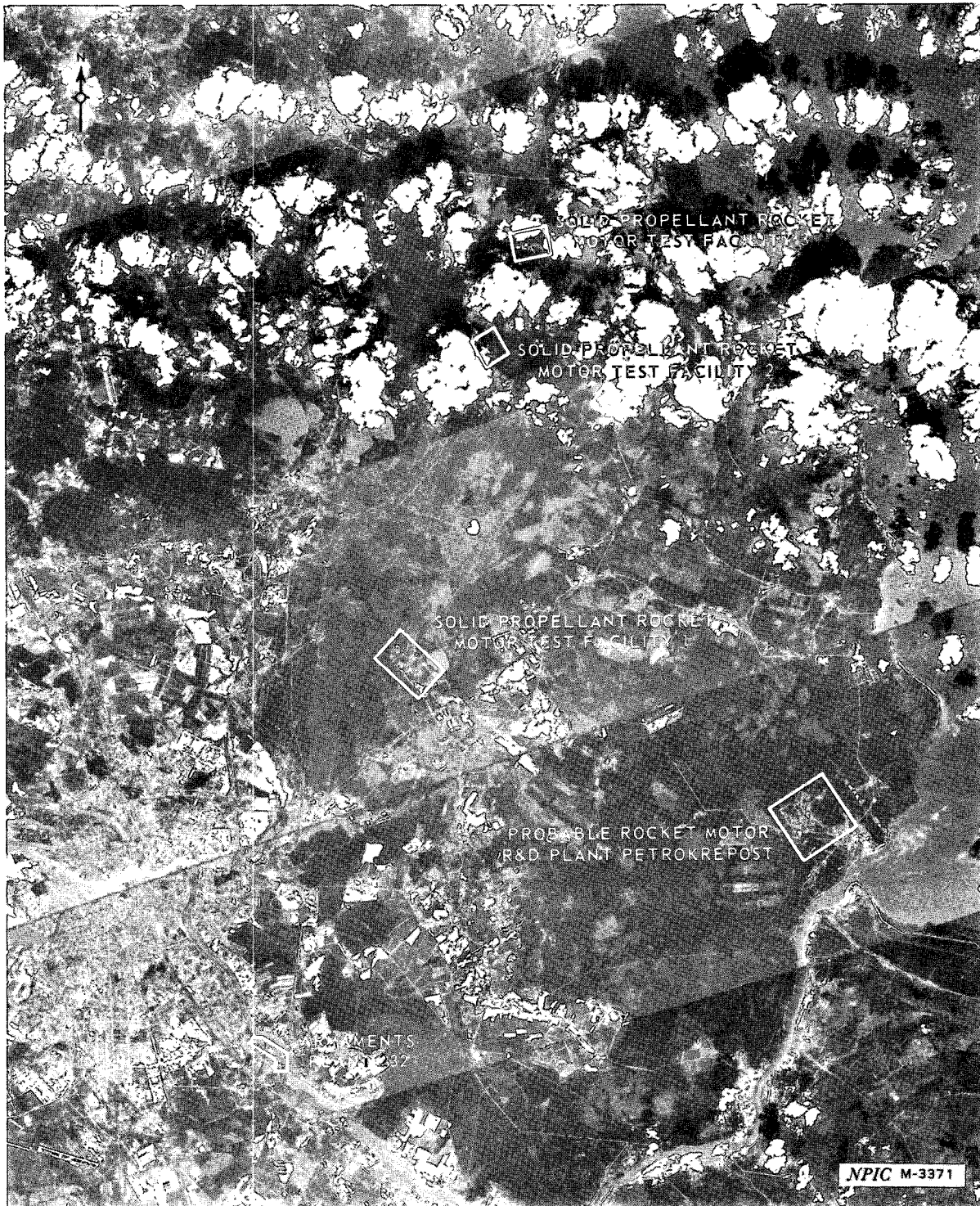


FIGURE 2. USSR: CITY OF Leningrad

Leningrad 0-3

TOP SECRET

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25X1

TOP SECRET

March 1968

25X1
25X1**LENINGRAD: SOLID PROPELLANT ROCKET MOTOR TEST FACILITIES**

TEST FACILITY 1: 60-03-40N 030-36-39E; [REDACTED]

25X1

[REDACTED]
Tel/Ad---; PO Box---; Zone---; T/P---

25X1

TEST FACILITY 2: 60-12-45N 030-42-10E; [REDACTED]

25X1

[REDACTED]
Tel/Ad---; PO Box---; Zone---; T/P---

25X1

TEST FACILITY 3: 60-15-30N 030-44-30E; [REDACTED]

25X1

[REDACTED]
Tel/Ad---; PO Box---; Zone---; T/P---

25X1

Introduction

Three Solid Propellant Rocket Motor Test Facilities are located north-northeast of Leningrad, USSR. Their respective distances from Leningrad are: Test Facility 1, 8 nautical miles (nm); Test Facility 2, 16 nm; and Test Facility 3, 18 nm. The facilities vary in complexity and contain a combined total of at least 12 large/medium-size horizontal test positions and four small firing positions without test cell structures. The following chronology is based on photography from the World War II era through September 1967.

Photographic Chronology

The three test facilities will be described and depicted individually. However, because they were frequently photographed on the same missions (Msn), dates and Msn numbers of significant photography are presented here to avoid repetition:

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Solid Propellant Rocket Motor Test Facility 1 (Figures 1-4). Several of the buildings in the inspection and support areas of Test Facility 1 were present at the time of German photography of May 1943. The four horizontal test buildings (items 1-4, Figure 2), the control building (item 5), and the transloading area were added between December 1961 and April 1963. The first KH-7 photography was obtained in March 1964; at that time the facility appeared externally complete. Figures 3 and 4 present perspective views and plan drawings of the test positions. The site also includes eight naturally protected buildings probably used for the inspection/storage of rocket motors prior to and after test firings; four unprotected build-

Leningrad 2-1

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March 1968

ings, probably support structures, are located southeast of the inspection area.

The first apparent signs of test activity were observed at two test buildings (items 1 and 2) in March 1965. The photography of June 1967 revealed blast marks at all four horizontal test positions.

Solid Propellant Rocket Motor Test Facility 2 (Figures 5 and 6). This test facility was not present on German photography of 1943, but was probably present in December 1961. Test Facility 2 is secured and contains five test positions (items A - E, Figure 6). Firing positions B, C, and D appear to be small notches cut in low rises of the ground, and A and E are horizontal test positions. There is also a revetted possible burn area which may be used for microscale motor testing or disposal of faulty motors.

Two blast marks and a probable blast mark were visible [] the test effects extending as far out as 630 feet from the apparent tiedown point. The lack of symmetry in the blast marks suggests numerous firings at each point; the marks are shaped according to the correct expansion ratio for a rocket motor blast, thus negating vegetation burning as a cause. The extreme simplicity of the site and the indicated horizontal firing support the identification as a test facility for rocket motors.

25X1

Other facilities at the site include a control building (item 1), an earth-mounded tank, and a single unidentified earth-mounded structure. There are at least five possible observation points; of these, at least three are small structures above the ground and two are dug into it. A tall crescent-shaped structure (item 2), consisting of six uprights with a horizontal cap along the top of them, occupies an isolated position on the west side of the site. This structure may be used for handling the motor hardware. Service roads extend to each of the test points from the main road into the facility.

In June 1967 the presence of two large light-toned blast marks and a probable blast mark indicated a continuing high level of testing activity; the more northerly blast mark, at Position A, was 630 feet long, and the southern one, at Position E, was 570 feet long.

Solid Propellant Rocket Motor Test Facility 3 (Figures 7 and 8). This test facility is relatively new. It was not present in July 1962, was observed under construction in April 1963, and appeared to be complete in March 1964. The site then comprised a double-fenced area containing five revetted horizontal test positions, a control structure (item 11, Figure 8), and various support buildings. In January 1966 the test positions consisted of five U-shaped revetments, each enclosing an area measuring about 130 by 100 feet. Each position appeared to contain at least one tiedown firing position.

The first apparent signs of test activity were seen in June 1967; at that time two large light-toned blast marks measuring 480 feet long and 510 feet long were observed. A new horizontal test position was identified in September 1967, as well

Leningrad 2-1 (Continued)

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March 1968

as a new possible vertical subsurface firing position. These test positions appear complete; however, no apparent signs of test activity have been observed. This facility is considered operational.

Discussion & Evaluation

Several support buildings at Facility 1 were present in 1943 when the general vicinity was designated an artillery test/training area. Conversion to solid propellant rocket motor testing probably had begun by 1961, inasmuch as Facility 2 was probably complete by December 1961, although construction was continuing at Facility 1 in 1963 and Facility 3 did not appear complete until 1964. Only Facility 1 is rail served, and connections to central control bunkers can be confirmed only at Facilities 1 and 3. The cells at Facility 1 are located in revetted natural cutbacks with the thrust blocks housed internally. The thrust blocks of the two larger cells at Facility 2 are comparable in size to those at the five barricaded cells at Facility 3.

Facility 1 has four test cells, two of which are slightly flared at the firing end. Of the five test cells in Facility 2, two are comparable to positions at Facility 3 and the three smaller ones, cut into a bluff, are probably subscale firing positions. There are seven test positions at Facility 3, five of them protected by earthen barricades; one of the five may contain a possible altitude simulation capability. The two remaining positions at Facility 3 are unique: the newly identified horizontal test position is the only one at Facility 3 with an enclosed thrust block, and the seventh is a possible vertical subsurface firing position.

It is possible that one of these test facilities is used for production proof testing of missile boosters produced at Leningrad Probable Rocket Motor R&D Plant Petrokrepost (see Section 3). The size, number of test cells, and layout of the three test facilities indicate that they are involved with one or more types of large, single or clustered, solid motors. Since there is no apparent solid propellant production capability, however, their involvement is possibly research and development or production proof testing of motors produced in the Leningrad area. The apparent capability of these facilities to test any solid motor that has thus far been observed in parades indicates that these facilities may provide not only surface-to-air booster research and development and production proof testing, but also testing for larger solid motors.

Leningrad 2-1 (Continued)

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FIGURE 1. USSR: SOLID PROPELLANT ROCKET MOTOR TEST FACILITY 1 NEAR LENINGRAD (MISSION

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Leningrad 2-2

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March 1968

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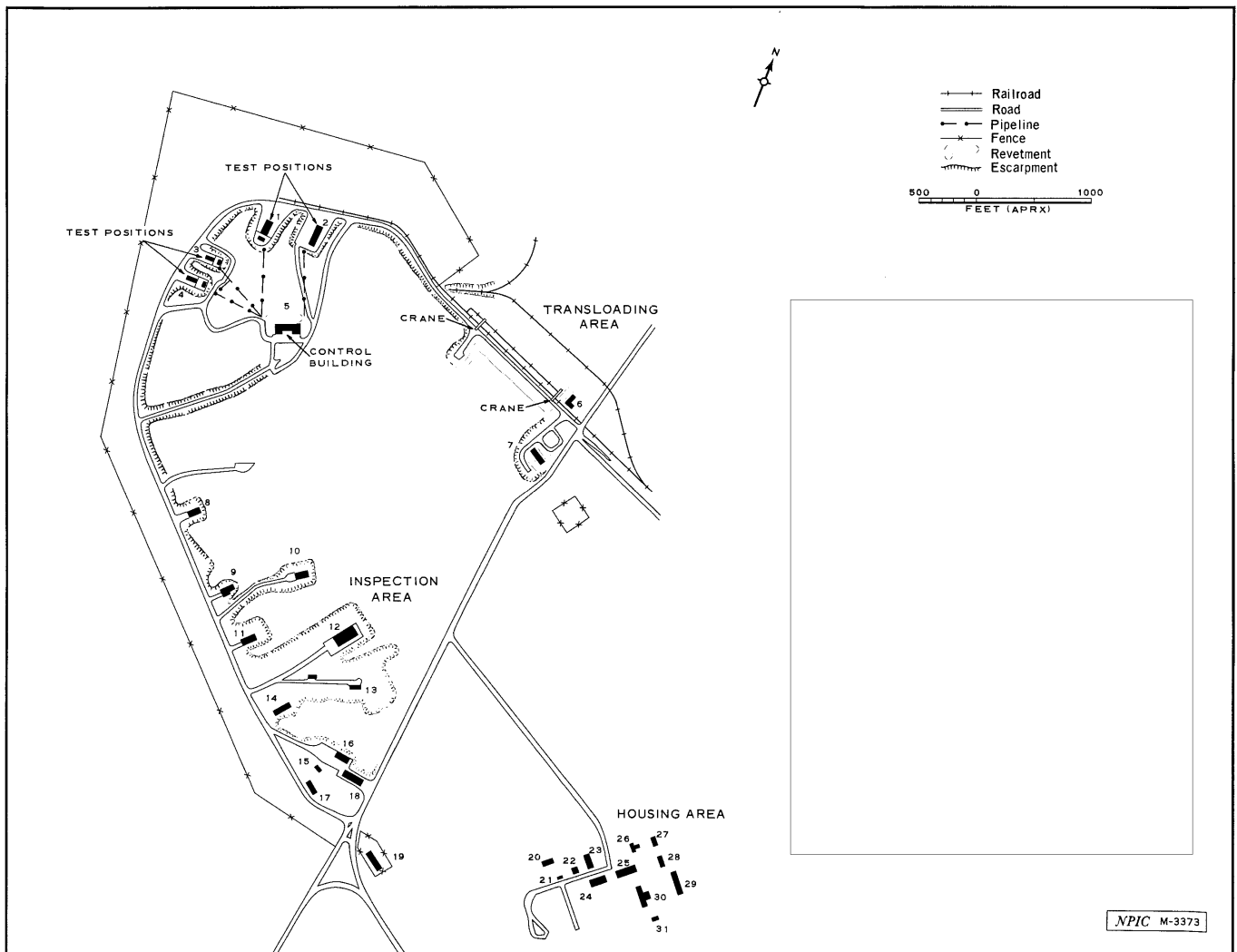


FIGURE 2. USSR: LAYOUT AND ROOF COVERAGE OF SOLID PROPELLANT ROCKET MOTOR TEST FACILITY 1 NEAR LENINGRAD.

Leningrad 2-3

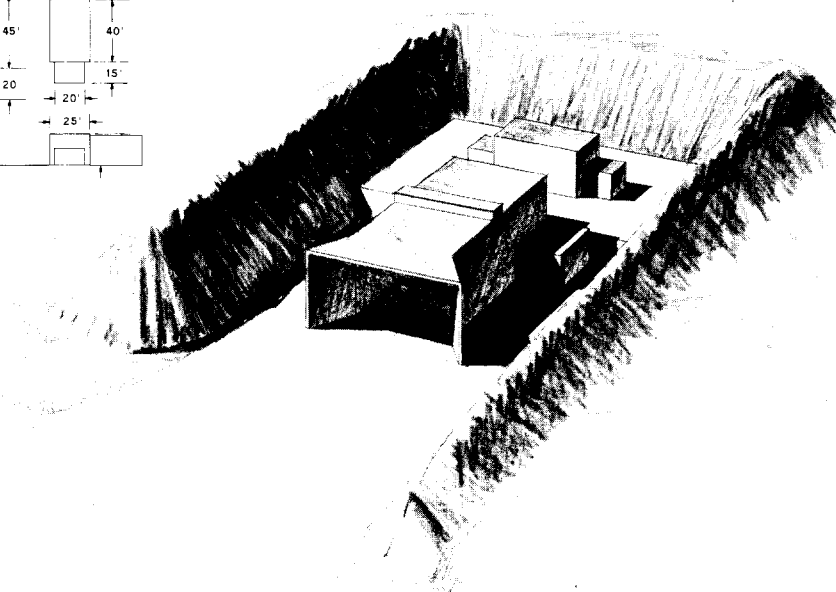
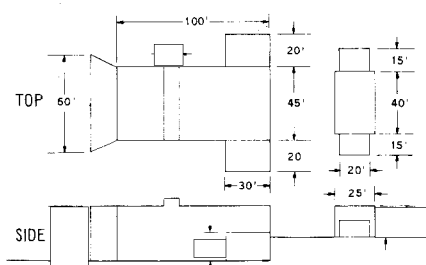
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March 1968



TEST POSITION 1

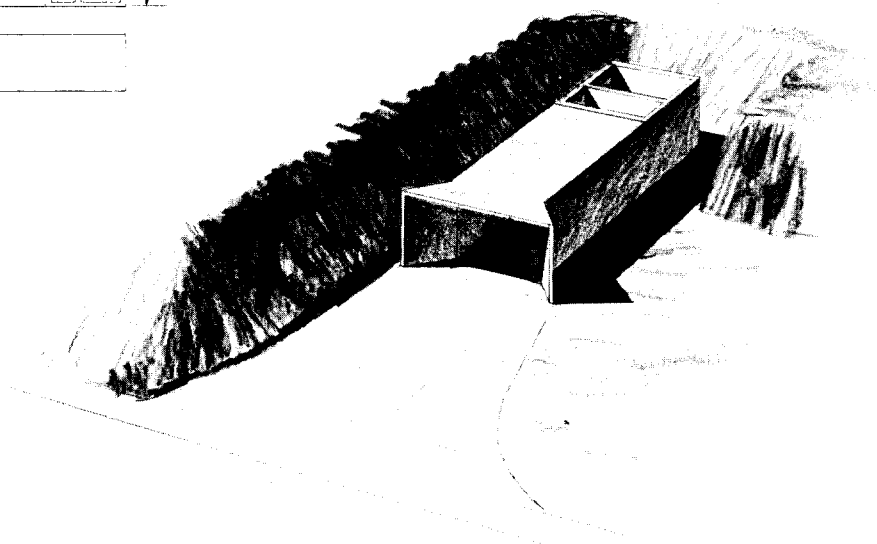
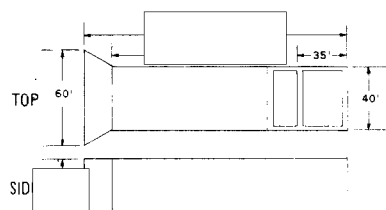


FIGURE 3. USSR: TEST POSITIONS 1 AND 2, SOLID PROPELLANT ROCKET MOTOR TEST FACILITY 1 NEAR LENINGRAD. Item numbers are keyed to Figure 2.

Leningrad 2-4

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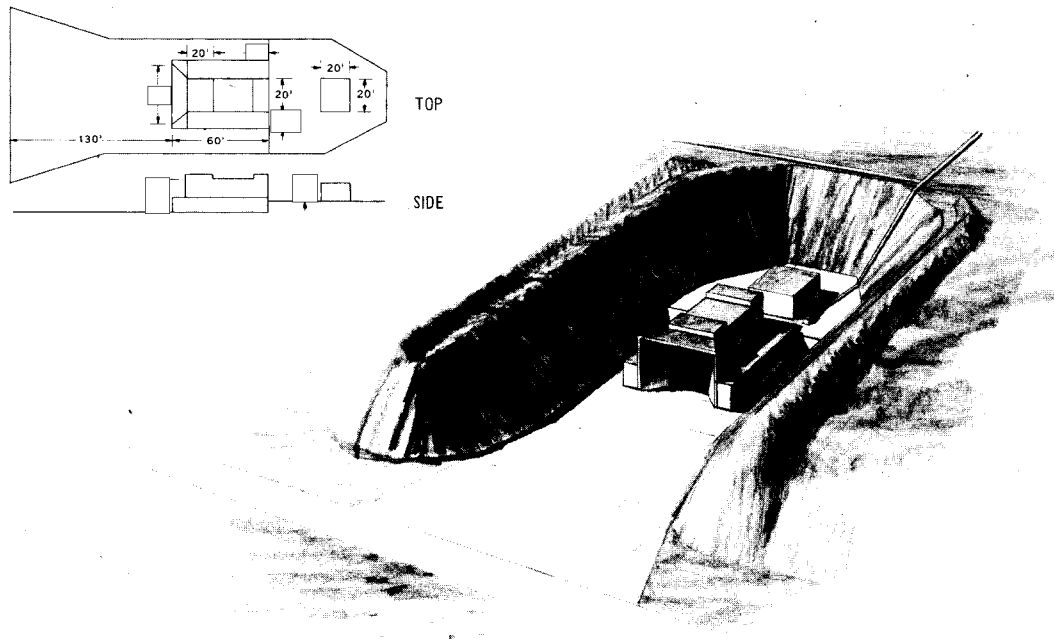
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March 1968

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NPIC M-3375

FIGURE 4. USSR: TEST POSITION 3, SOLID PROPELLANT ROCKET MOTOR TEST FACILITY 1 NEAR LENINGRAD; TEST POSITION 4 IS ALMOST IDENTICAL. Item numbers are keyed to Figure 2.

Leningrad 2-5

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FIGURE 5. USSR: SOLID PROPELLANT ROCKET MOTOR TEST FACILITY 2 NEAR LENINGRAD (MISSION

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Leningrad 2-6

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March 1968

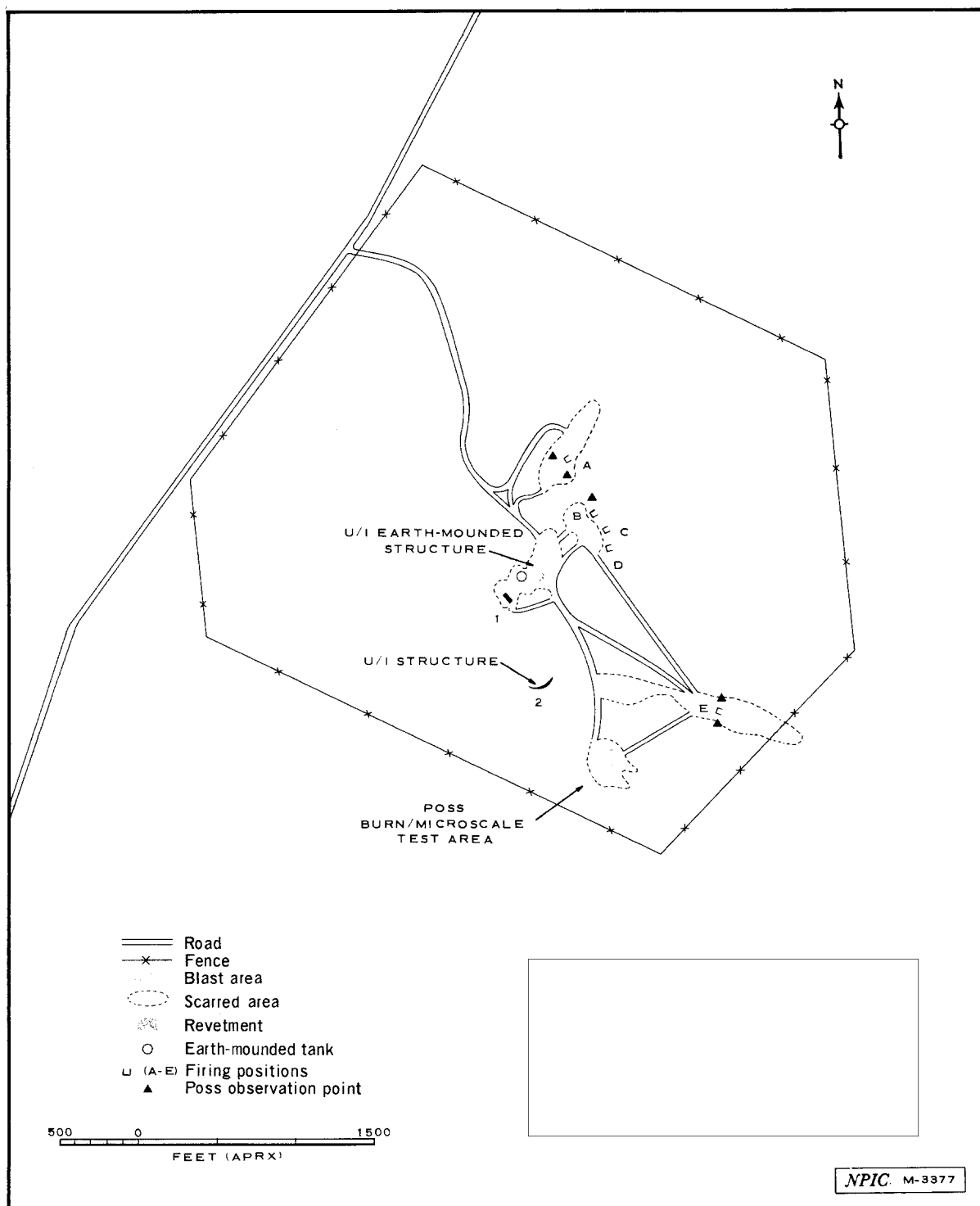


FIGURE 6. USSR: LAYOUT AND ROOF COVERAGE OF SOLID PROPELLANT ROCKET MOTOR TEST FACILITY 2 NEAR LENINGRAD.

Leningrad 2-7

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March 1968



FIGURE 7. USSR: SOLID PROPELLANT ROCKET MOTOR TEST FACILITY 3 NEAR LENINGRAD (MISSION

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Leningrad 2-8

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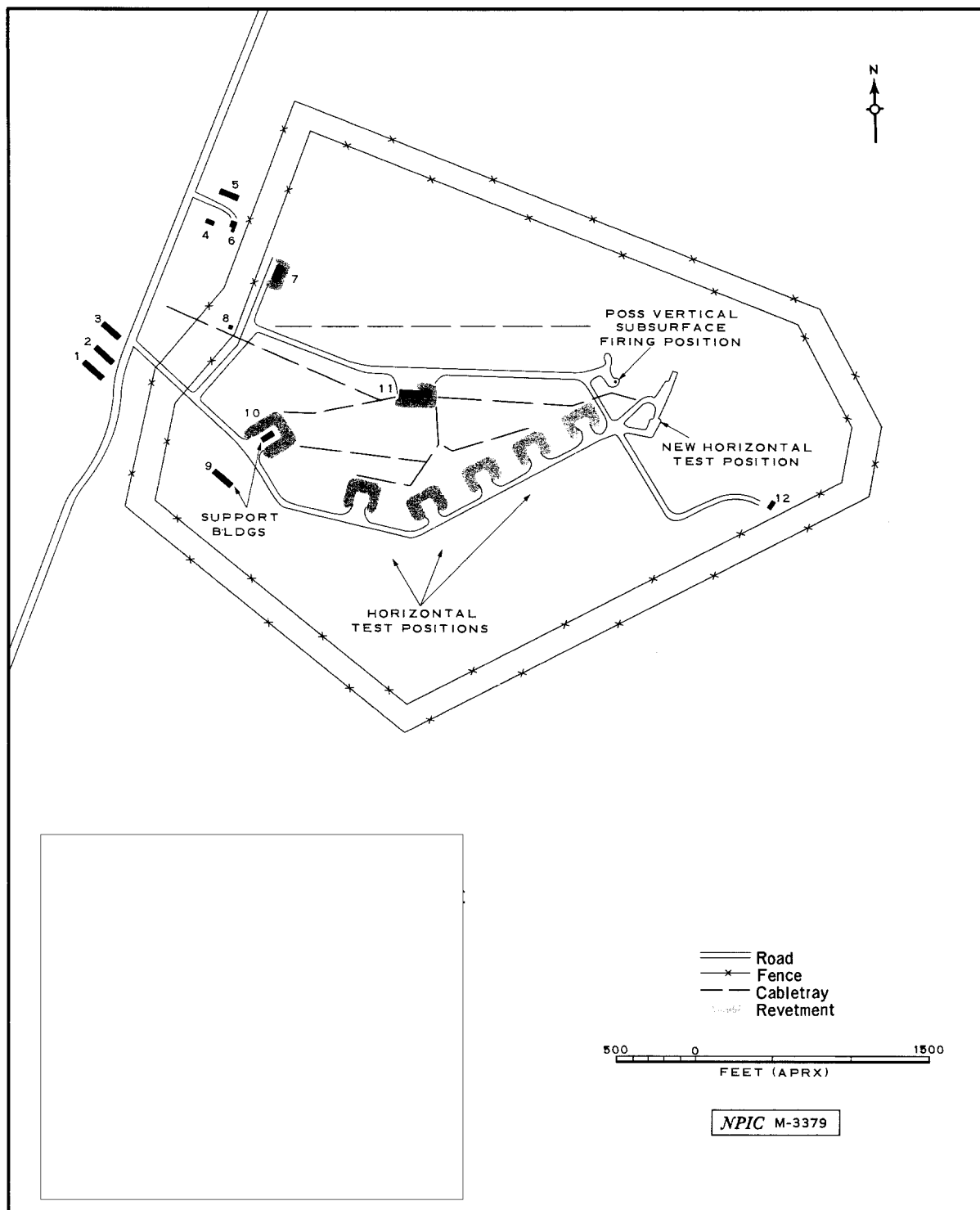
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FIGURE 8. USSR: LAYOUT AND ROOF COVERAGE OF SOLID PROPELLANT ROCKET MOTOR TEST FACILITY 3 NEAR LENINGRAD.

Leningrad 2-9

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March 1968

LENINGRAD: PROBABLE ROCKET MOTOR R&D PLANT PETROKREPOST

59-59-10N 031-00-20E: [REDACTED]

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25X1

Tel/Ad---; PO Box---; Zone---; T/P---

Introduction

The Probable Rocket Motor R&D Plant Petrokrepost is located about 16 nautical miles (nm) east of Leningrad, USSR, and 2 nm north of Petrokrepost. The plant contains two older plant areas dating from the World War II era, a new plant area, two possible test areas (one of them new), and housing and support facilities. The most recent photography used in the chronology was obtained in June 1967.

Photographic Chronology

This plant was formerly referred to as the Petrokrepost Explosives Plant Morozov; the older plant areas were present at the time of German photography of September 1942. The two old plant areas and their adjacent storage facilities appeared capable of producing explosives.

The first usable KEYHOLE photography, obtained in [REDACTED] revealed that significant new construction and removal of obsolete buildings had taken place since 1942. A total of at least 50 new buildings (Figure 2) had been added to the housing area, the new plant area, and the possible test area. Only limited continuing construction activity at support structures within the new plant area was observed during 1964 and 1965.

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The first KH-7 photography of good interpretability was obtained in [REDACTED] revealing the completion of construction at the new plant area. A new possible test area (items 54 and 55) was then in the early stages of construction. The plant appeared to be engaged in the research, development, and limited production of composite propellant rocket motors. By [REDACTED] the new possible test area was in the late stages of construction. No signs of test activity were then present. It is possible that this plant has been producing a modified double-base propellant formulation in the new area, extruding in Building 59 (a rolling and extrusion-type building) and casting in Building 45 (a possible casting/curing building).

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Discussion & Evaluation

This plant existed during the World War II era as a producer of explosives. Extensive new construction and removal of obsolete structures took place between 1942 and 1963, and it is possible that the plant is now producing a modified double-base propellant and/or composite propellant. Factory markings information indicates that the SA-2 (GUIDELINE) missile is produced at Leningrad Plant 272; the boosters for these missiles may be provided by this plant at Petrokrepost.

Leningrad 3-1

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FIGURE 1. USSR: PROBABLE ROCKET MOTOR R&D PLANT PETROKREPOST NEAR LENINGRAD

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Leningrad 3-2

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March 1968

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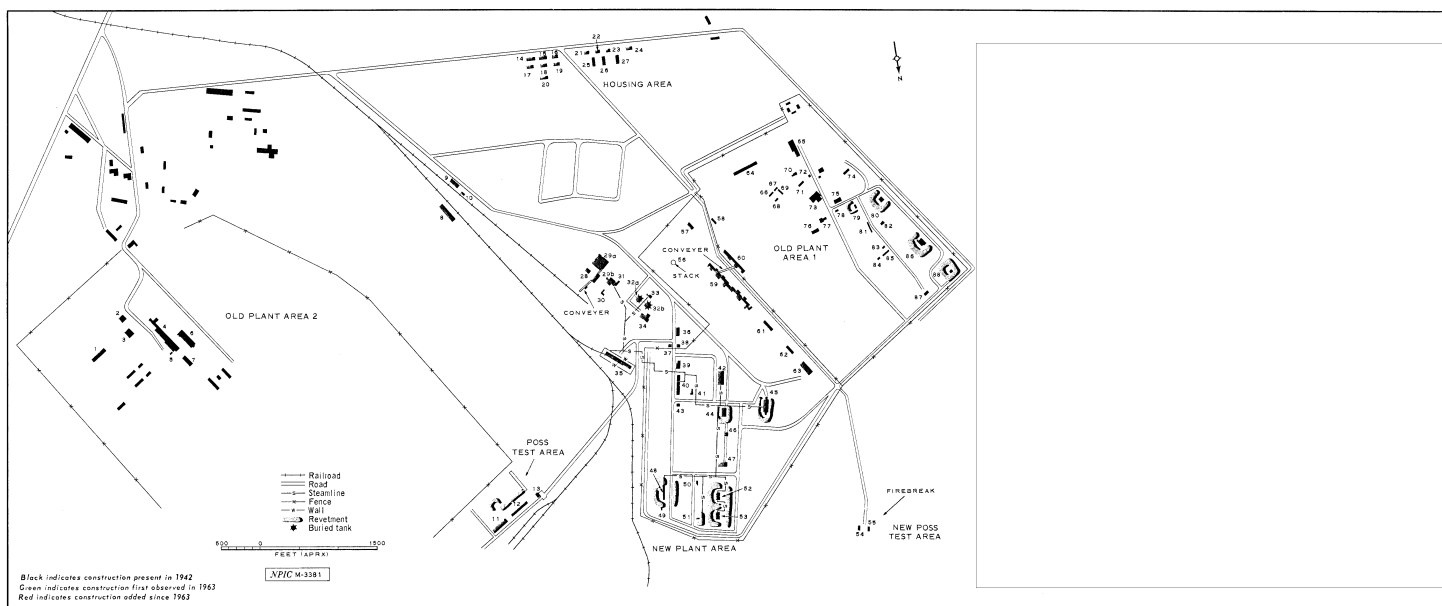


FIGURE 2. USSR: LAYOUT AND ROOF COVERAGE OF PROBABLE ROCKET MOTOR R&D PLANT PETROKREPOST NEAR LENINGRAD.

Leningrad 3-3

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MOSKVA

	<u>Section</u>
City of Moskva	0
Missile and Space Development Center Kaliningrad 88	1
Missile and Space Propulsion Development Center Khimki 456	2
Zagorsk Rocket Engine Test Facility Krasnozavodsk	3
Guided Missile R&D Plant Khimki 301	4
Guided Missile Plant Tushino 82	5
Guided Missile R&D and Production Center (Aerodynamic) Reutovo 67	6
Central Aerohydrodynamic Institute (TsAGI) Ramenskoye	7
Central Institute of Aviation Engine-Building (TsIAM)	8
Space Research Facility Tomilino	9

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March 1968

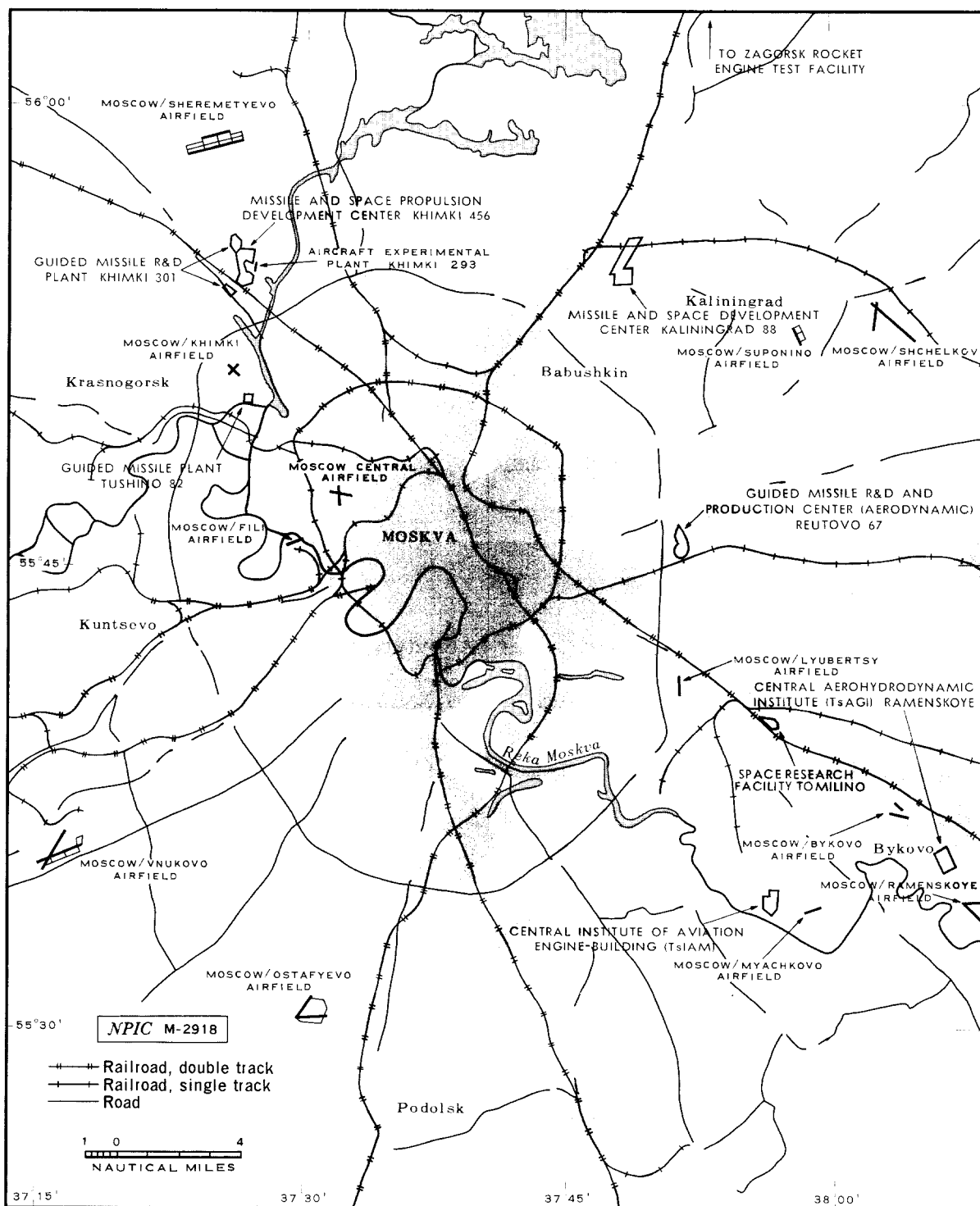


FIGURE 1. USSR: CITY OF MOSKVA.

Moskva 0-2

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March 1968

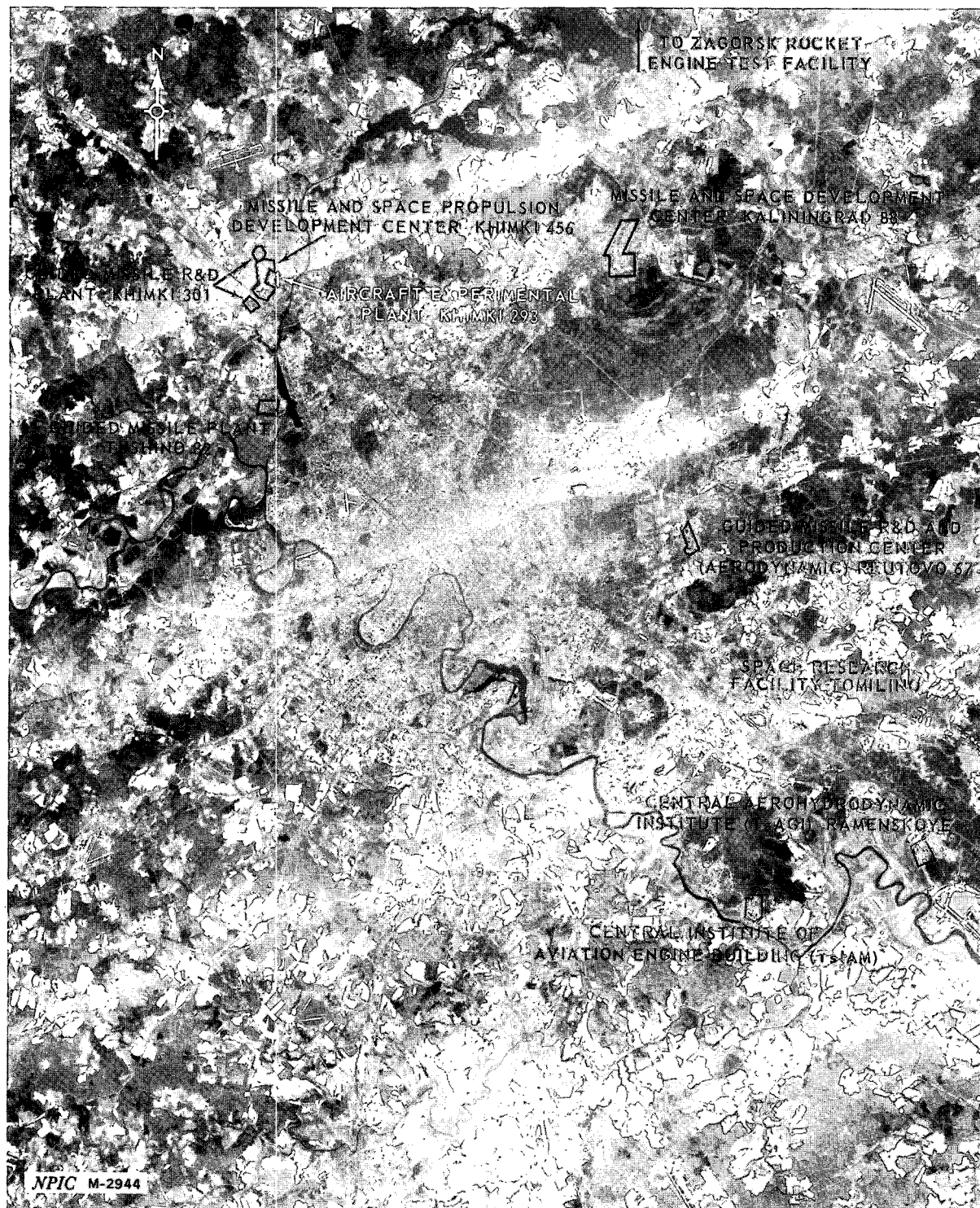


FIGURE 2. USSR: CITY OF MOSKVA

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Moskva 0-3

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MOSKVA: SPACE RESEARCH FACILITY TOMILINO

55-39-58N 037-56-05E;

COMIREX No None

Tel/Ad ---; PO Box 1052; Zone ---; T/P ---

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Introduction

The Space Research Facility Tomilino is located in the Moskva suburb of Tomilino, approximately 12 nautical miles (nm) southeast of the center of Moskva, USSR, and approximately 7.5 nm northeast of the Central Aerohydrodynamic Institute (TsAGI), which is located near Ramenskoye (see Moskva, Section 7). The Tomilino Facility is situated at the intersection of the Moskva/Ryazan and the Moskva/Kazan rail lines. In May 1967 the facility contained 5 laboratory buildings, 1 administration/laboratory building, a large horizontal pressure bottle farm, a very large assembly/shop building, and 5 large shop buildings. Other facilities present were mainly support structures, including several small shops, administration and utility buildings, 2 steamplants, a transformer yard, and numerous warehouses.

Photographic Chronology

When observed on German photography of January 1943, the area now occupied by the Space Research Facility Tomilino was identified as a supply depot. It contained 190 single-story warehouses, 8 small workshops, a probable steamplant, and 2 water towers. Two additions, a laboratory building (item 17) and the large pressure bottle farm (item 21), were observed on ground photography of December 1960. This photography also revealed 3 laboratory buildings (items 18, 20, and 23) in an early stage of construction.

The first usable KEYHOLE photography, obtained in [REDACTED], disclosed that many of the older facilities observed in 1943 had been removed and new structures added, including a completed transformer yard and a small shop building. A large combination assembly and shop building (item 1) was in an early stage of construction, and the 3 laboratory buildings seen under construction in 1960 had been completed.

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Little or no significant new construction was observed between May 1962 and May 1964. By [REDACTED] several new facilities were under construction, including a laboratory building (item 11) and a shop building (item 2). Both of these buildings and the large assembly and shop building first seen in 1962 were completed by [REDACTED]

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Between [REDACTED] only 4 new structures were added: an administration/laboratory building (item 22), 2 apartment build-

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Moskva 9-1

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ings, and a small administration building. The most recently observed activity was the construction of a small building (item 19), also seen in May 1967.

Discussion & Evaluation

The Moskva Space Research Facility Tomilino, which is the Alekseyev Experimental Design Bureau (OKB), is subordinated to the USSR Ministry of Aviation Industry. It is located in the general vicinity of the Moscow/Lyubertsy Airfield. Since the mid-1950s the OKB of Semen Mikhaylovich Alekseyev has been performing limited research and designing and developing a line of products associated with life support. Experimental facilities include man-rated vacuum chambers, centrifuge, ejection seat tower, and slipstream test devices for escape hatches. Additionally, the OKB responsibility includes rocket sled testing of product line items; this testing is apparently performed approximately 17 miles to the southeast at the Ministry of Aviation Industry's Faustovo test complex.

The products include aircraft and spacecraft life support equipment. Specific items within the design responsibility of the facility are spacesuits, the Laika (Sputnik II) environmental capsule, ejection seats, and the environmental control systems for aircraft.

Moskva 9-1 (Continued)

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March 1968

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FIGURE 1. USSR: SPACE RESEARCH FACILITY TOMILINO NEAR MOSKVA

Moskva 9-2

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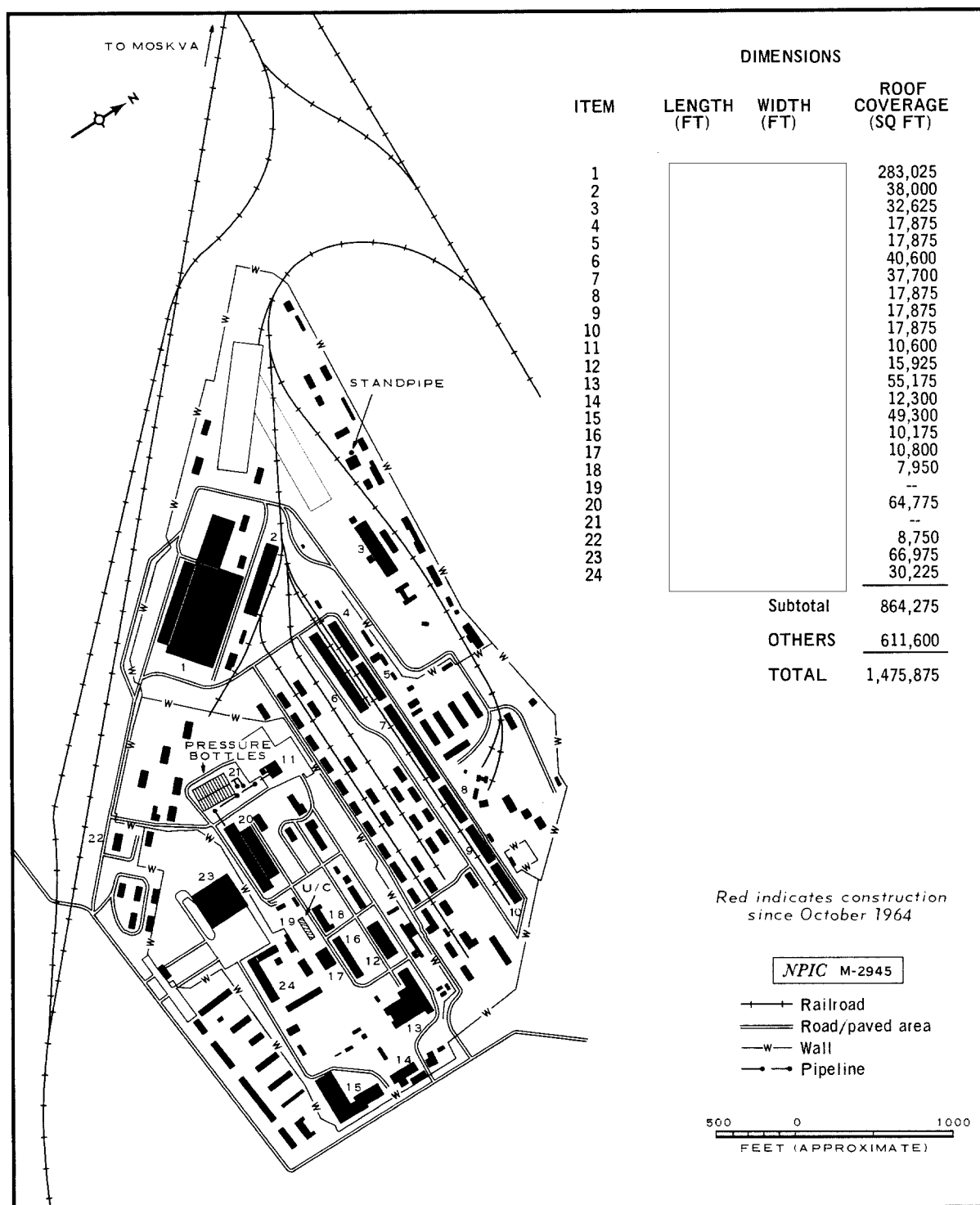
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March 1968

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FIGURE 2. USSR: LAYOUT AND ROOF COVERAGE OF SPACE RESEARCH FACILITY TOMILINO NEAR MOSKVA.

Moskva 9-3

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March 1968

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OMSK: AIRCRAFT ENGINE PLANT 29

54-57-40N 073-25-30E; [REDACTED]

25X1

[REDACTED]
Tel/Ad SUPPORT; PO Box 64; Zone 21; T/P ---

25X1

Introduction

Aircraft Engine Plant 29 is located on the eastern edge of Omsk, USSR immediately north of Airframe Plant 166 [REDACTED] (see Omsk, Section 2). In July 1967 the major facilities of Plant 29 included 3 large assembly/shop buildings, 1 large assembly/test building, 10 shop buildings, 2 forges/foundries, a transshipment building, 3 steamplants, and a large assembly/shop building under construction. The plant also contains administration buildings, warehouses, utility buildings, and other supporting elements.

25X1

Photographic Chronology

Aircraft Engine Plant 29 was first observed on TALENT photography of [REDACTED] [REDACTED] The first usable KEYHOLE photography was obtained in [REDACTED] when a completed transshipment building (item 4) was observed for the first time and a shop building (item 2) and a large assembly/shop building (item 10) were observed in a midstage of construction. New additions to a shop building (item 24) and to 1 of the large assembly/shop buildings (item 14) were under construction. Photography of [REDACTED] [REDACTED] revealed a large number of small structures such as shops, warehouses, utility buildings, and spray ponds which were not visible on earlier coverage but could have been present or under construction in December 1961. The 2 buildings (items 2 and 10) reported in a midstage of construction in 1961 were completed by June 1962, as were the additions to Buildings 24 and 14.

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A shop building (item 19) and a small addition to an administration building (item 12) were completed between [REDACTED] [REDACTED] Construction began on a small administration building in June 1963 and on a small utility building (item 27) in September 1964; both were completed by [REDACTED] The completion of a small administration building (item 13) and the expansion of another (item 28) took place between [REDACTED]

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The most recent construction activity at Plant 29 is the expansion of the transshipment building (item 4) and the construction of a large assembly/shop building (item 3), first observed under construction in [REDACTED]

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Omsk 1-1

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March 1968

Discussion & Evaluation

The first association of Plant 29 with a missile-related location was in 1959 when it was linked with an unidentified facility in Dnepropetrovsk. It has long been considered that the plant is potentially identifiable as a producer of missile engines. The only possible connection with the missile program occurred in January 1961 when a representative of the plant was noted at the Kapustin Yar Missile Test Range. Some of the many missile-related flights by Omsk-based GKAT (State Committee for Aviation Technology) aircraft may be in support of this facility.

To date, there has been no information which would positively identify any missile-/space-related activity at this plant or to identify any systems with which Plant 29 may be involved. At the present time the plant is manufacturing the ASH-82 piston engine for current production helicopters. In addition, it produces replacement engines for the older COACH/CRATE transports and for export, as well as spare parts.

Omsk 1-1 (Continued)

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March 1968

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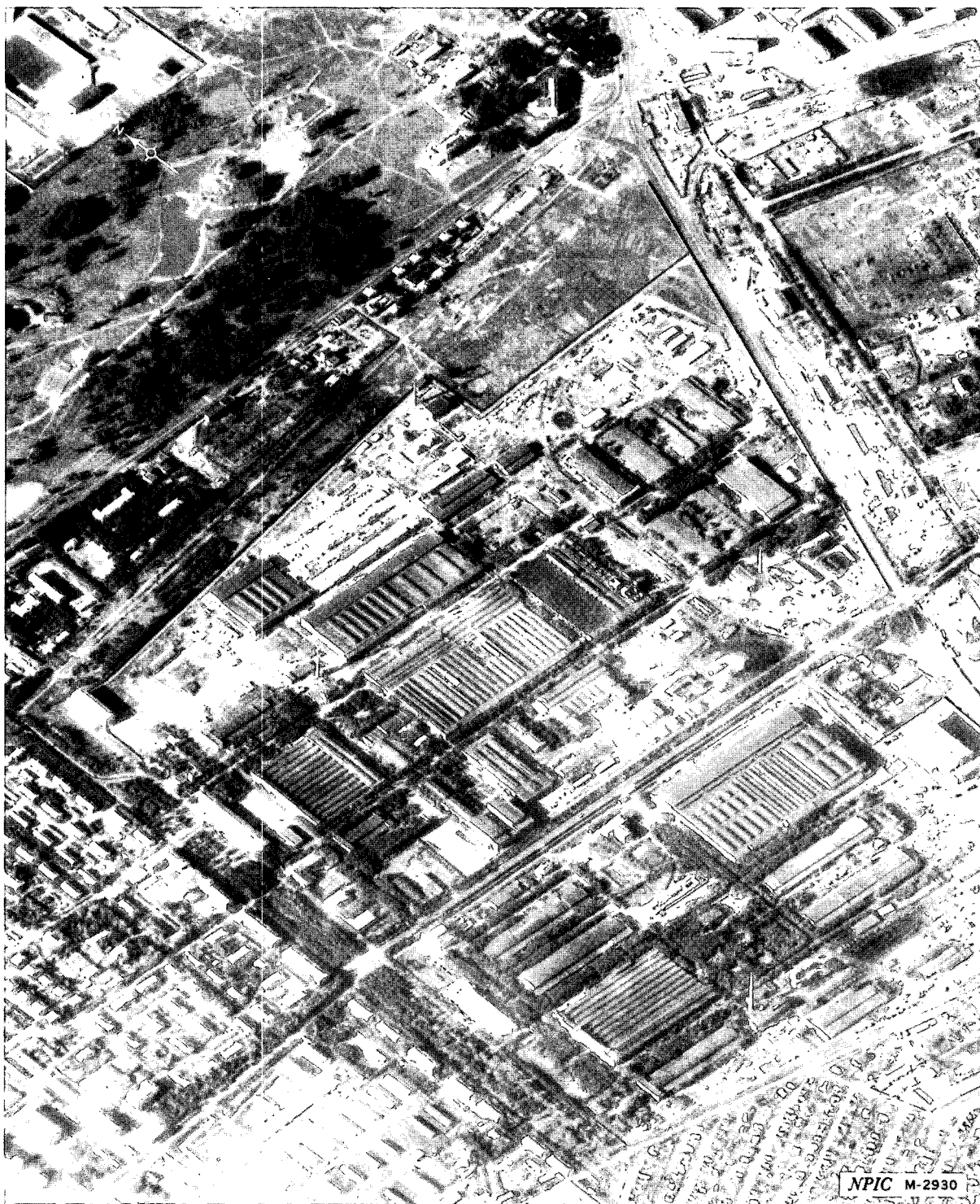


FIGURE 1. USSR: AIRCRAFT ENGINE PLANT 29 AT OMSK

Omsk 1-2

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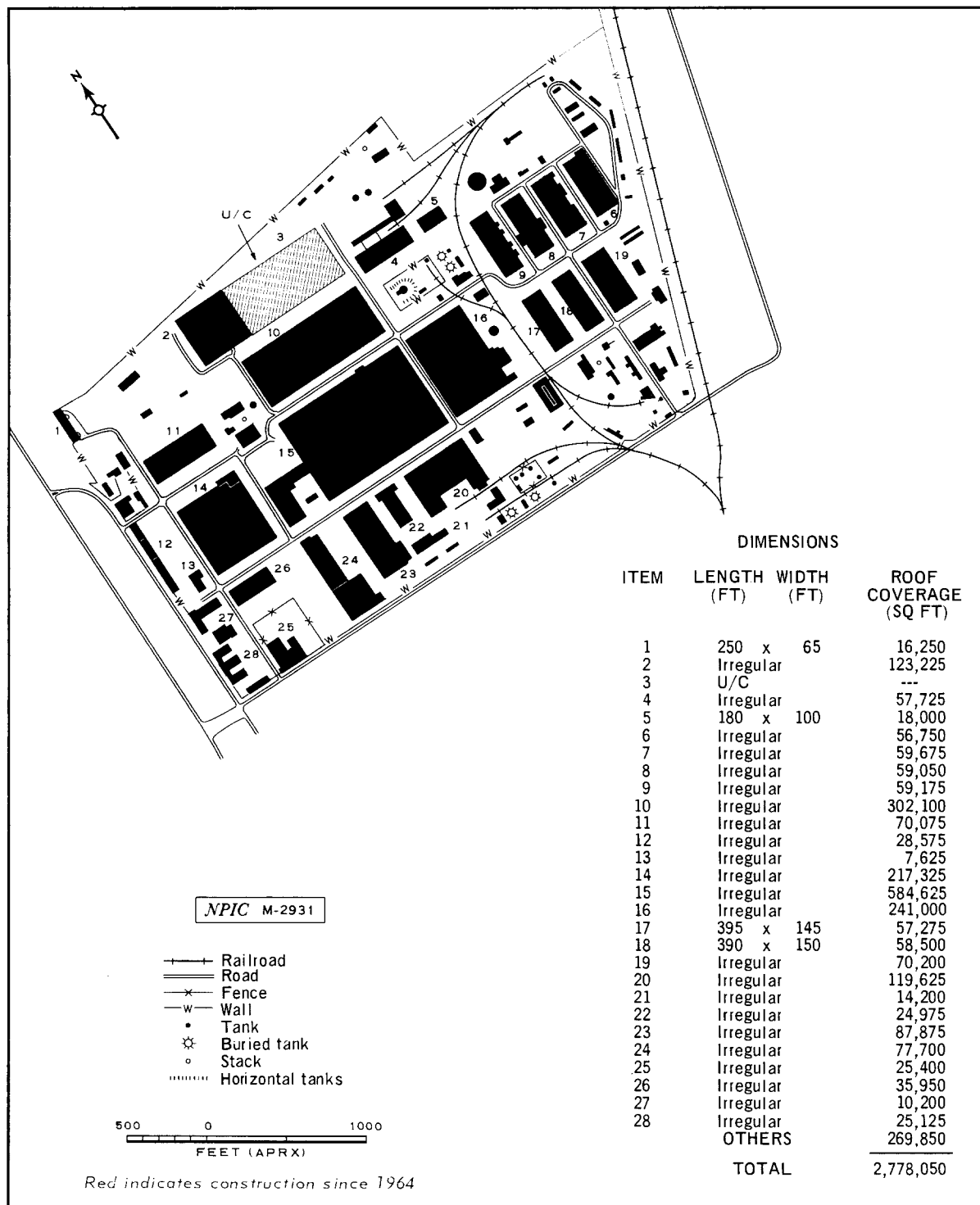


FIGURE 2. USSR: LAYOUT AND ROOF COVERAGE OF AIRCRAFT ENGINE PLANT 29 AT OMSK.

Omsk 1-3

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PEI-CHING

	<u>Section</u>
City of Pei-ching (Peking)	0
Guided Missile Development and Production Center Chang-hsin-tien	1

Pei-ching 0-1



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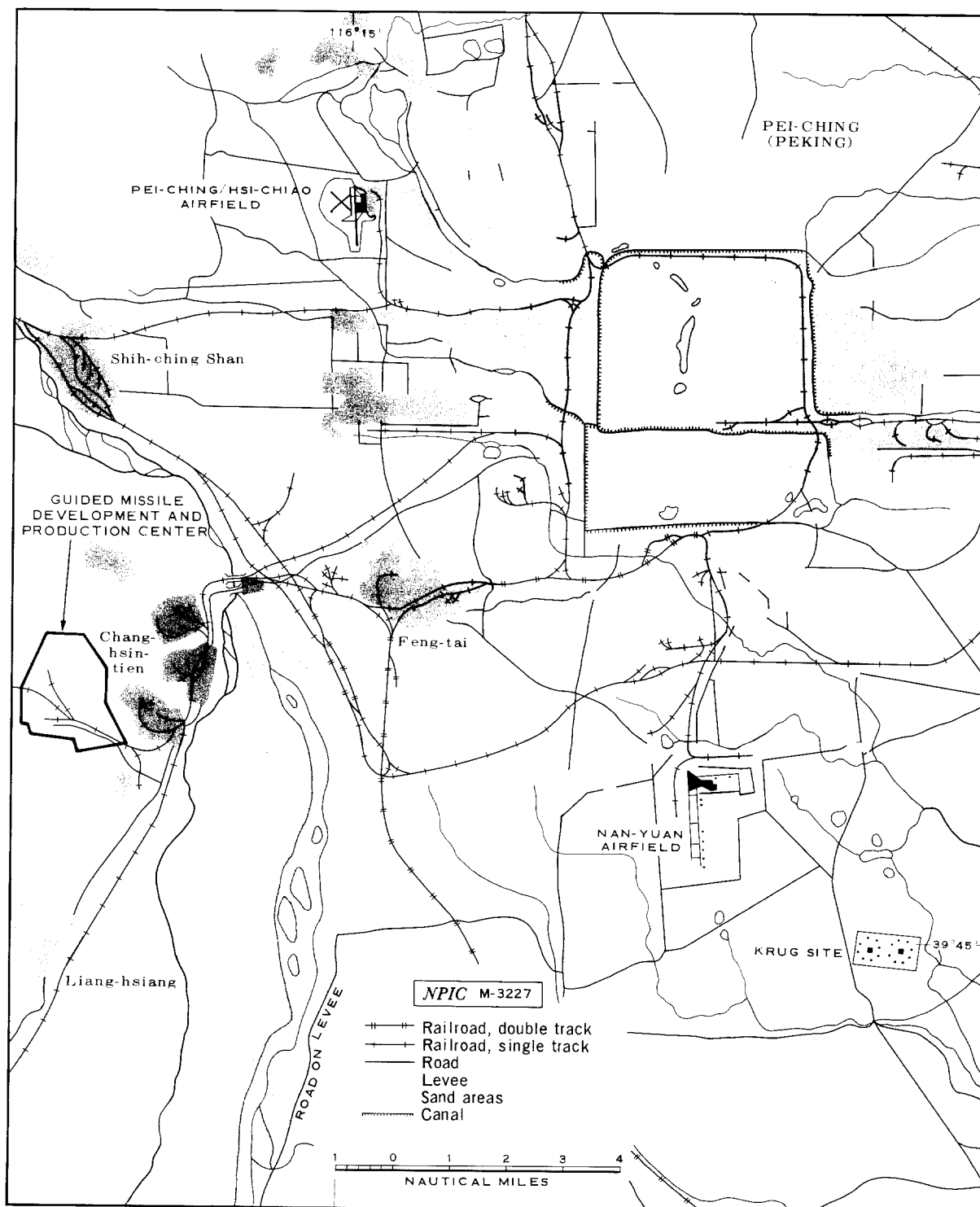


FIGURE 1. CHINA: CITY OF PEI-CHING (PEKING).

Pei-ching 0-2

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March 1968

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FIGURE 2. CHINA: CITY OF PEI-CHING

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Pei-ching 0-3

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PEI-CHING: GUIDED MISSILE DEVELOPMENT AND PRODUCTION CENTER CHANG-HSIN-TIEN

39-48-45N 116-07-54E; [REDACTED]

25X1

[REDACTED]
Tel/AD---; PO Box ---; Zone ---; T/P---

25X1

Introduction

The Guided Missile Development and Production Center is located 3 nautical miles (nm) west of Chang-hsin-tien and 13 nm southwest of Pei-ching (Peking), China. The center is bisected by a rail spur, the area north of the spur designated the Rocket Engine Test Facility (Figures 1 and 2) and that south of the spur, the Development and Production Facility (Figures 3 and 4). The Rocket Engine Test Facility contains three vertical test stands and a horizontal test site (Figure 5). The following chronology is based on photography through September 1967.

Photographic Chronology

The Pei-ching Guided Missile Development and Production Center Chang-hsin-tien was first seen on photography of June 1959, when major components of the Development and Production Facility were complete and earth scarring was visible at the future site of the Rocket Engine Test Facility. KEYHOLE photography of [REDACTED] revealed that two test stands (items 1 and 2, Figure 2) were in place, as well as approximately 60 percent of the other structures now present.

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Test Stands 1 and 2 were probably operational in 1962, as was the nearby Horizontal Test Site. At the time of the [REDACTED] construction had begun on a third test stand (item 3, Figure 2). Photography of [REDACTED] revealed that the third test stand was still under construction, but its major support building (item 14, Figure 2) appeared complete. Construction of Test Stand 3 appeared to be complete by [REDACTED] and the stand probably became operational late in 1963. This photography also revealed a test in progress at the Horizontal Test Site.

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Construction activity at the north end of the Rocket Engine Test Facility was first visible in September 1963 and had progressed sufficiently by [REDACTED] to be identified as a probable propellant production area. Construction continued in the northeast part of the test facility, where a components test area was identified with test positions for horizontal firing.

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25X1

In the Development and Production Facility (Figure 4), a wind tunnel (item 7) was constructed between [REDACTED]

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Pei-ching 1-1

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March 1968

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[redacted]. Nearby are three engineering buildings and a group of horizontal pressure tanks which resemble facilities for gas dynamic-type supersonic wind tunnels.

25X1

The closed-circuit wind tunnel appeared to be operational in [redacted] [redacted], and a small diffuser/aspirator had been erected near the west end of the probable test building (item 4, Figure 4). The 1966 photography revealed that a tapered cylindrical object approximately [redacted] long and tapering in diameter from about [redacted] at the other was moved from an open storage yard to the Research and Development Area and finally attached to a probable test building (item 4, Figure 4) in [redacted]. The same December photography revealed activity in the sump area of Test Stand 3 (Figure 2).

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Continued construction activity, probably for alterations or refurbishing, was evident in the sump of Test Stand 3 in [redacted] [redacted] four new buildings were observed under construction in the Probable Propellant Production Area. [redacted] also revealed a possible rocket engine or other piece of missile-related equipment close to a support building (item 9, Figure 2) east of Test Stand 2.

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Discussion & Evaluation

This installation consists of a test stand area, an area containing laboratory/institutional-type buildings, and a third area containing fabrication/assembly-type buildings. These facilities are supported by apartment-type housing nearby. A wind tunnel, of at least transonic capacity, is also located within the center.

The design of the test stands suggests a primary interest in the test of liquid systems. Stand capacity extends from SRBM through ICBM and space-class system size ranges. A twin-bay stand suggests a capacity for sequential and/or staging tests. Both air liquefaction and fuel blending/production facilities support the test activity and may be used for research in fuels and cryogenics technology.

While solid motor tests may have been accomplished in the past (1963-64) at the horizontal test facility, it is unlikely that this is a continuing mission; it is much more likely that liquid-system research and development, fabrication, and testing is under way at this installation, especially in view of the other facilities available in China for the solid propellant development programs.

In summary, it is judged that the entire installation comprises the center of Chinese research, development, and testing of liquid propellant missile and space systems. In addition, a capacity to fabricate a limited number of missiles/space vehicles exists within the facility. The assignment of this modest manufacturing capacity is based on evidence relating to extensive missile manufacturing capacity at another installation in China and is further warranted by the extension of Chinese efforts in the ICBM area as demonstrated by construction and modification of Launch Complex B (ICBM or space launch facility) at Shuang-cheng-tzu.

Pei-ching 1-1 (Continued)

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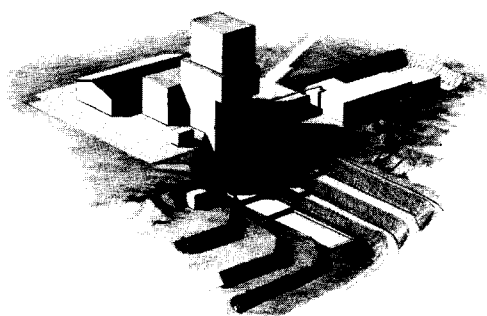
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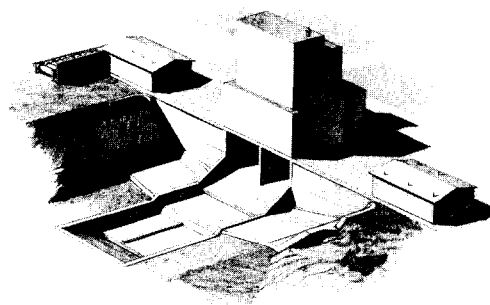
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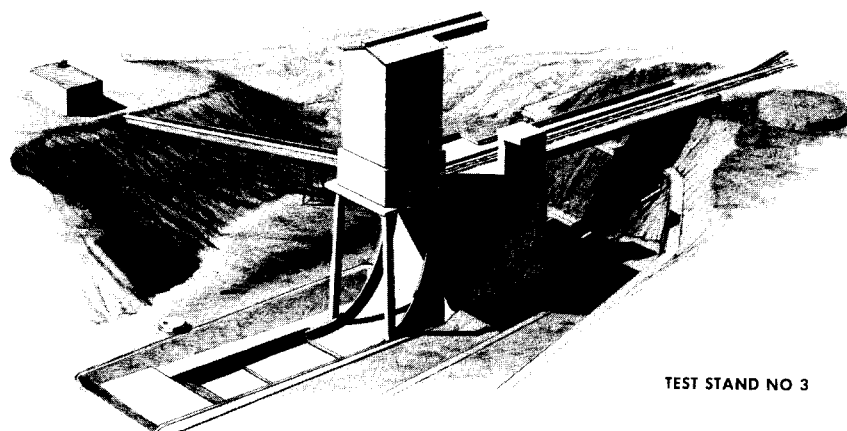
March 1968



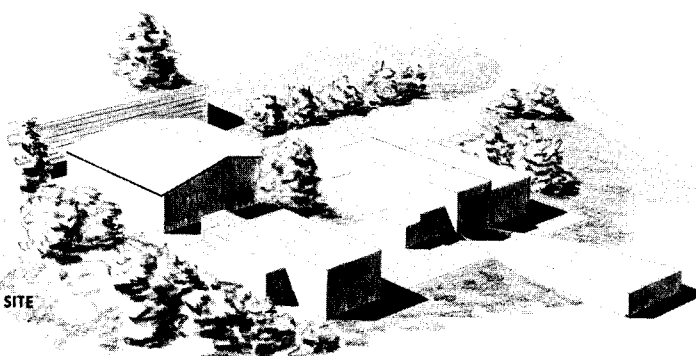
TEST STAND NO 1



TEST STAND NO 2



TEST STAND NO 3



HORIZONTAL TEST SITE

NPIC M-3233

FIGURE 5. CHINA: PERSPECTIVE VIEWS OF TEST STRUCTURES AT ROCKET ENGINE TEST FACILITY, PEI-CHING GUIDED MISSILE DEVELOPMENT AND PRODUCTION CENTER CHANG-HSIN-TIEN.

Pei-ching 1-6

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PERM

	<u>Section</u>
City of Perm	0
Armament Plant 172	1
Aircraft Engine Plant 19	2
Rocket Engine Test Facility	3
Solid Propellant Rocket Motor Test Facility	4
Munitions and Chemical Combine K. Kirov 98 (includes Solid Motor Production Plant)	5

Perm 0-1

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March 1968

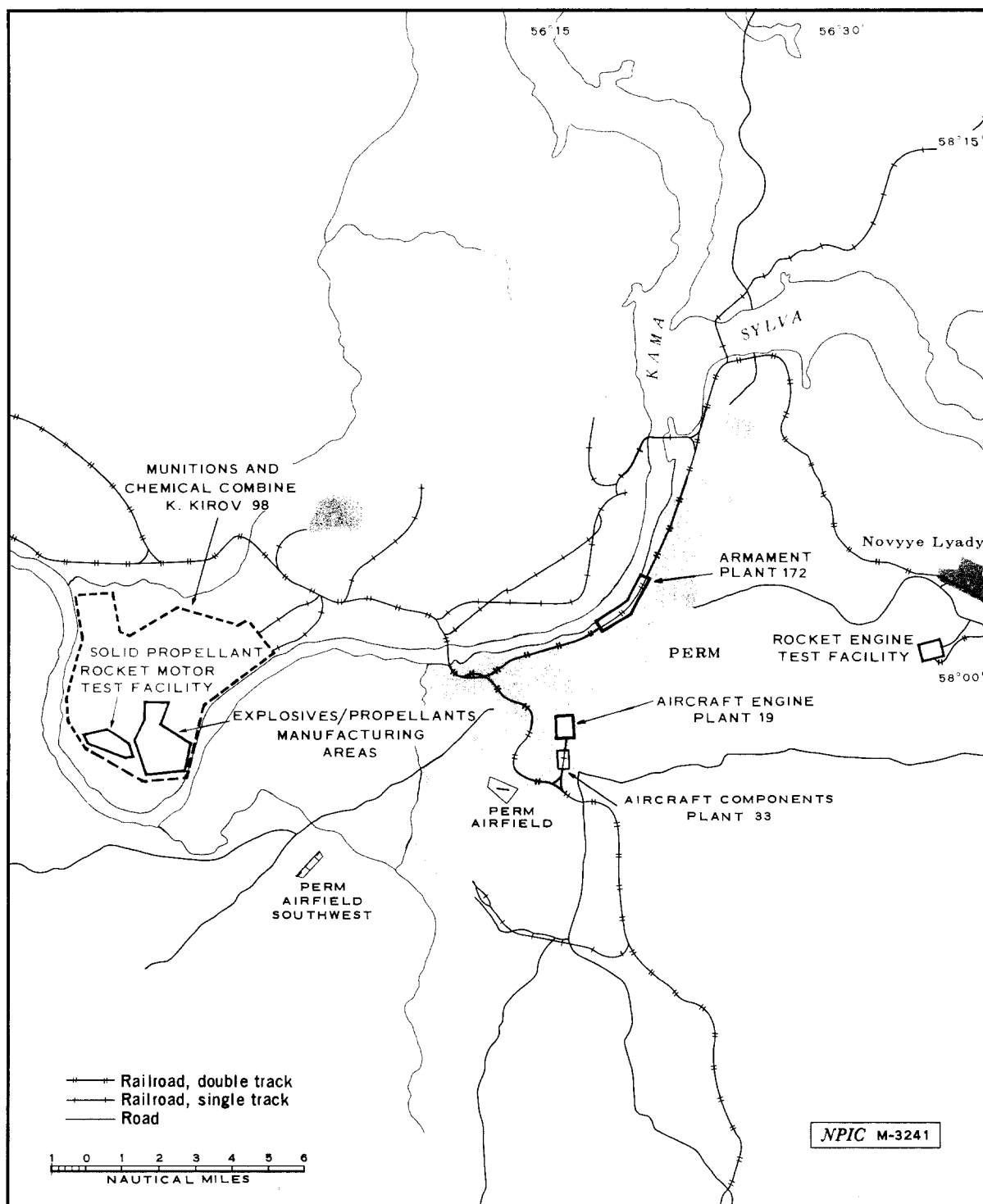


FIGURE 1. USSR: CITY OF PERM.

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FIGURE 2. USSR: CITY OF PERM

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PERM: SOLID PROPELLANT ROCKET MOTOR TEST FACILITY

57-57-05N 055-51-00E;

25X1

Tel/Ad---; PO Box---; Zone---; T/P---

25X1

Introduction

The Solid Propellant Rocket Motor Test Facility is located in the southwest corner of Munitions and Chemical Combine K. Kirov 98 (see Section 5), about 14 nautical miles west-southwest of Perm, USSR. The separately secured test facility contains a horizontal test cell, two small rocket motor test buildings, possible assembly and nondestructive test buildings, and various support structures. A separately secured isolated test position is situated about 1,800 feet southwest of the facility. The following chronology is based on photography through December 1966.

Photographic Chronology

The Perm Solid Propellant Rocket Motor Test Facility was first observed on KEYHOLE photography in [REDACTED]. This photography was of very poor interpretability; consequently only the blast deflector and the general outline of the facility could be confirmed. In [REDACTED] the large horizontal test cell (item 14) and the isolated test position were discernible for the first time, and the majority of the large buildings were also identified. Support buildings and additional ground detail were evident on the more interpretable photography of 1963-64. The only new construction observed during those two years was a possible assembly and checkout building (item 4) begun in [REDACTED]

25X1

[REDACTED] and externally complete in [REDACTED]

25X1

25X1

25X1

Although there was no significant construction during [REDACTED] melted snow around the horizontal test cell indicated recent test activity. This was the first photographic evidence of testing observed at this facility. Several support structures were built during the 1965-66 period, and walls were added connecting the isolated test position with the test facility and the munitions combine.

25X1

25X1

The larger-scale photography of [REDACTED] permitted the functional identification of two small solid rocket motor test buildings (items 6 and 7) and a nondestructive test building (item 11). Weathering of the concrete facing of the blast deflector at the horizontal test cell, indicative of test activity over a long period of time, was observed in August. In December, blast marks from recent test firings could be seen in the snow at the horizontal test cell and at the isolated test position.

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March 1968

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Discussion & Evaluation

On the basis of photography, this installation has been identified as a solid propellant rocket motor test facility. It is probably utilized for testing motors produced at the adjacent solid motor production plant (see Section 5). The facility probably became operational during the first half of 1965.

Perm 4-1 (Continued)

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March 1968

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FIGURE 1. USSR: SOLID PROPELLANT ROCKET MOTOR TEST FACILITY NEAR PERM

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March 1968

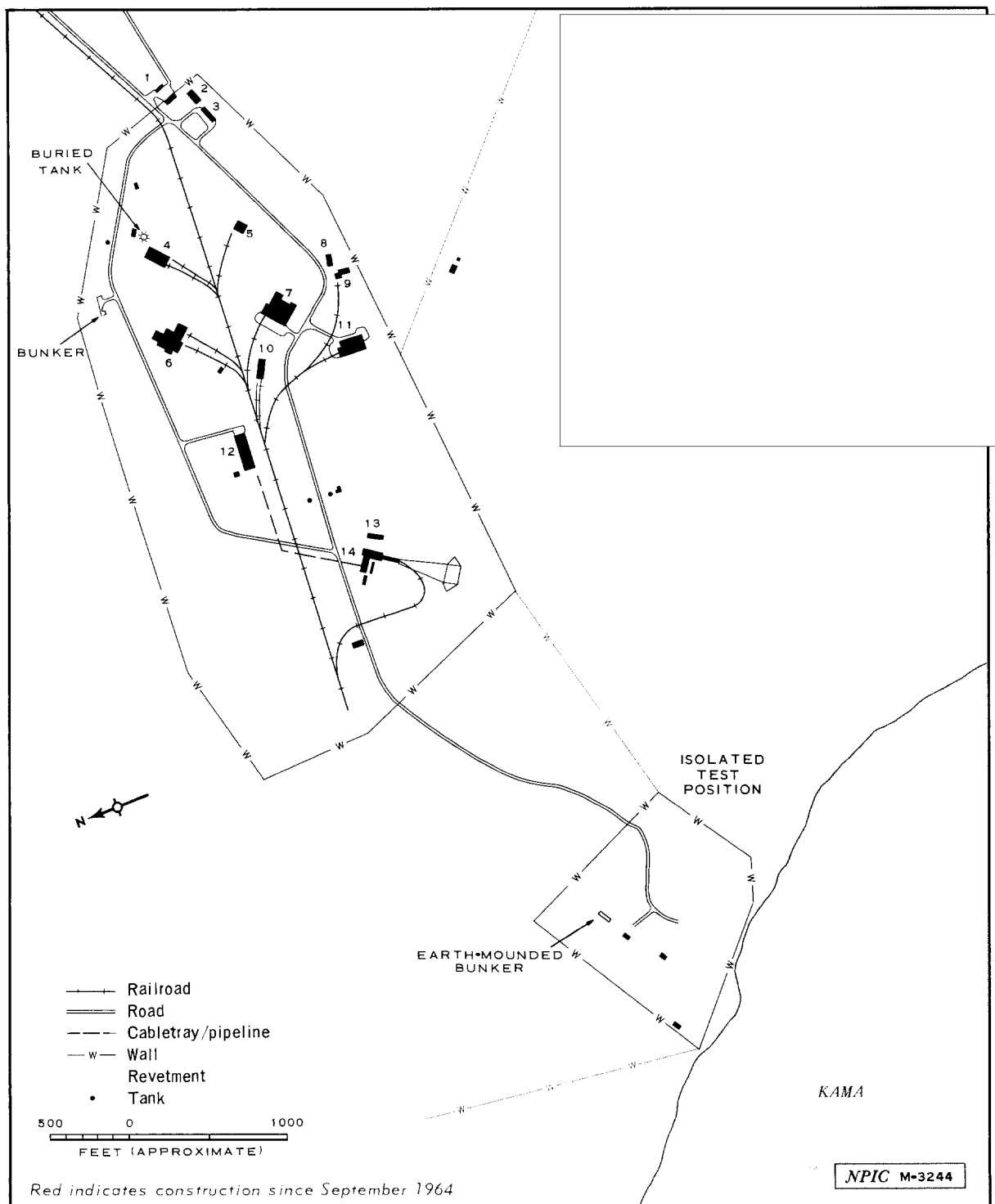
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FIGURE 2. USSR: LAYOUT AND ROOF COVERAGE OF SOLID PROPELLANT ROCKET MOTOR TEST FACILITY NEAR PERM.

Perm 4.3

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March 1968

PERM: MUNITIONS AND CHEMICAL COMBINE K. KIROV 98

57-58-31N 055-54-15E;

25X1

Tel/Ad KAMA; PO Box 397; Zone---; T/P 195

25X1

SOLID MOTOR PRODUCTION PLANT

57-58-30N 055-52-00E;

25X1

Introduction

Munitions and Chemical Combine K. Kirov 98 is located approximately 14 nautical miles west-southwest of Perm, USSR, along the north bank of the Kama River. Encompassing a large physical area (Figure 1), the combine includes an advanced solid propellant production facility, a modified solid propellant production facility, conventional propellant production facilities, an industrial explosives area, and an explosives storage area. A solid propellant rocket motor test facility is located in the southwest corner of Combine 98 (see Section 4). The following chronology is based on photography through December 1966.

Photographic Chronology

The major production areas listed above are described and depicted in separate sections. Because all or most of the combine was photographed on any given mission (Msn) mentioned in the chronology, the dates and Msn numbers of significant photography are listed here to avoid repetitious citations of this data in the various facility descriptions. The photography of 1961 was of such poor interpretability that it will be disregarded as a starting date in the chronology. The first usable photography was obtained

25X1

25X1

Advanced Solid Propellant Production Facility and Modified Solid Propellant Production Facility (Figures 2 and 3). The principal buildings in the modified propellant facility were discernible on photography of May, June, and August 1962. Construction had not yet begun in the area of the advanced propellant facility. The improved interpretability of the 1963 photography permitted the identification of two revetted buildings, a new administration/engineering building, and the expansion of a fabrication/assembly building at the modified propellant facility.

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FIGURE 1. USSR: MUNITIONS AND CHEMICAL COMBINE K. KIROV 98 NEAR PERM

Perm 5-1 (Continued)

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March 1968

At the advanced propellant facility, construction was also well under way at that time; a curing building, two casting/curing buildings, oxidizer preparation sections, and administration sections had been erected.

Seventeen new major structures were added to the advanced propellant facility during 1964, and the construction of two heavily revetted buildings was observed at the modified propellant facility. During 1965, construction continued at the advanced propellant facility; major construction included the completion of two large assembly buildings, and details of buildings and small support structures were discernible for the first time. No change was seen at the modified propellant facility.

In 1966, construction of a third blend/mix and casting section was begun at the advanced propellant facility. Pipelines/conveyers were visible on the first larger-scale photography of good interpretability. New construction was again seen at the modified propellant facility, where several small buildings were being erected in the west-central portion.

Conventional Propellant Production Facilities (Figures 4 and 5). These facilities, first observed in May 1962, represent the oldest and most extensive sections of Combine 98. Most of the buildings and support structures appeared complete and operational when first seen. The facilities include four nitroglycerine lines, a nitrocellulose production area, a probable double-base processing area, a probable single-base propellant area, and a shell-testing area which contains a small horizontal test building with an associated blast deflector. A double-base mixing and casting building appeared to be under construction in mid-1962 and was considered to be complete by June 1963. During late 1964 and 1965 a rail spur was extended into the southwest portion of these facilities, providing direct access to the test facility (see Section 4) and to the advanced and the modified propellant production facilities (Figures 2 and 3).

Only minor construction has been seen at these facilities from 1963 through the latest larger-scale photography in December 1966; at the latter time one building was under construction southwest of the nitroglycerine lines. The configuration of this structure and heavy revetting indicate that this building may be used for double-base casting/curing. Under construction since early 1966, the building was in a midstage of construction at the end of the year.

Industrial Explosives Area (Figures 6 and 7). The primary function of this area appears to be the storage of explosive materials. There are, however, some explosive processing buildings along the east side of the area. The secured area was first observed in June 1962; the poor interpretability of that photography precluded the identification of most of the storage buildings at that time. When next observed in June 1963, approximately 60 storage buildings were discernible, a typical small building measuring 50 by 30 feet. In addition to dense vegetation, earthen revetments provide blast protection for the storage buildings.

Perm 5-1 (Continued)

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TOP SECRET [REDACTED]

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The only changes observed in this area since 1962 have occurred on the east side, near the main entrance. In June 1963 a revetment was being constructed around a processing building. The building (item 3, Figure 7) appeared complete by February 1964 and a new large rectangular building (item 4) was then first observed under construction; Building 4 had been completed by December 1964. Since then, only one additional building has been erected; this small rectangular building was first seen in January 1966, again on the east edge of the area, outside the security wall.

Explosives Storage Area (Figures 8 and 9). When first observed in 1962, the storage area contained 28 buildings ranging in size from [REDACTED] feet; six groups of small sheds, averaging [REDACTED] were visible in the west portion of the area. No significant changes were observed between May 1962 and January 1966. Since January 1966, several of the sheds have been removed and activity has been seen around two of the storage buildings.

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Discussion & Evaluation

The identification of this complex as a producer of solid propellant and rocket motors is based on photography, collateral evidence, and the presence of the adjacent solid motor test facility (see Section 4). The complex includes two propellant manufacturing sections. The older, conventional plant is believed to manufacture single- and double-base propellants and explosives. The newer section is similar to the propellant manufacturing plants at Kamensk-Shakhtinskiy and Kemerovo (see Kamensk-Shakhtinskiy, Section 2, and Kemerovo, Section 2) and is thought to be producing a more advanced propellant, probably of a composite type.

Although the conventional plant appeared to be fully operational in January 1965, it is believed that it was sufficiently complete in mid-1963 to have supported work on solid motors. The advanced and modified solid propellant facilities which comprise the solid motor production plant were probably operational by the end of 1965. The modified solid propellant facility also possibly has an R&D function for composite propellants. It is assumed that motor cases and nozzles are fabricated at another site and shipped to these facilities for the manufacture of rocket motors.

Perm 5-1 (Continued)

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March 1968



FIGURE 2. USSR: ADVANCED SOLID PROPELLANT PRODUCTION FACILITY AND MODIFIED SOLID PROPELLANT PRODUCTION FACILITY, COMBINE 98 NEAR PERM

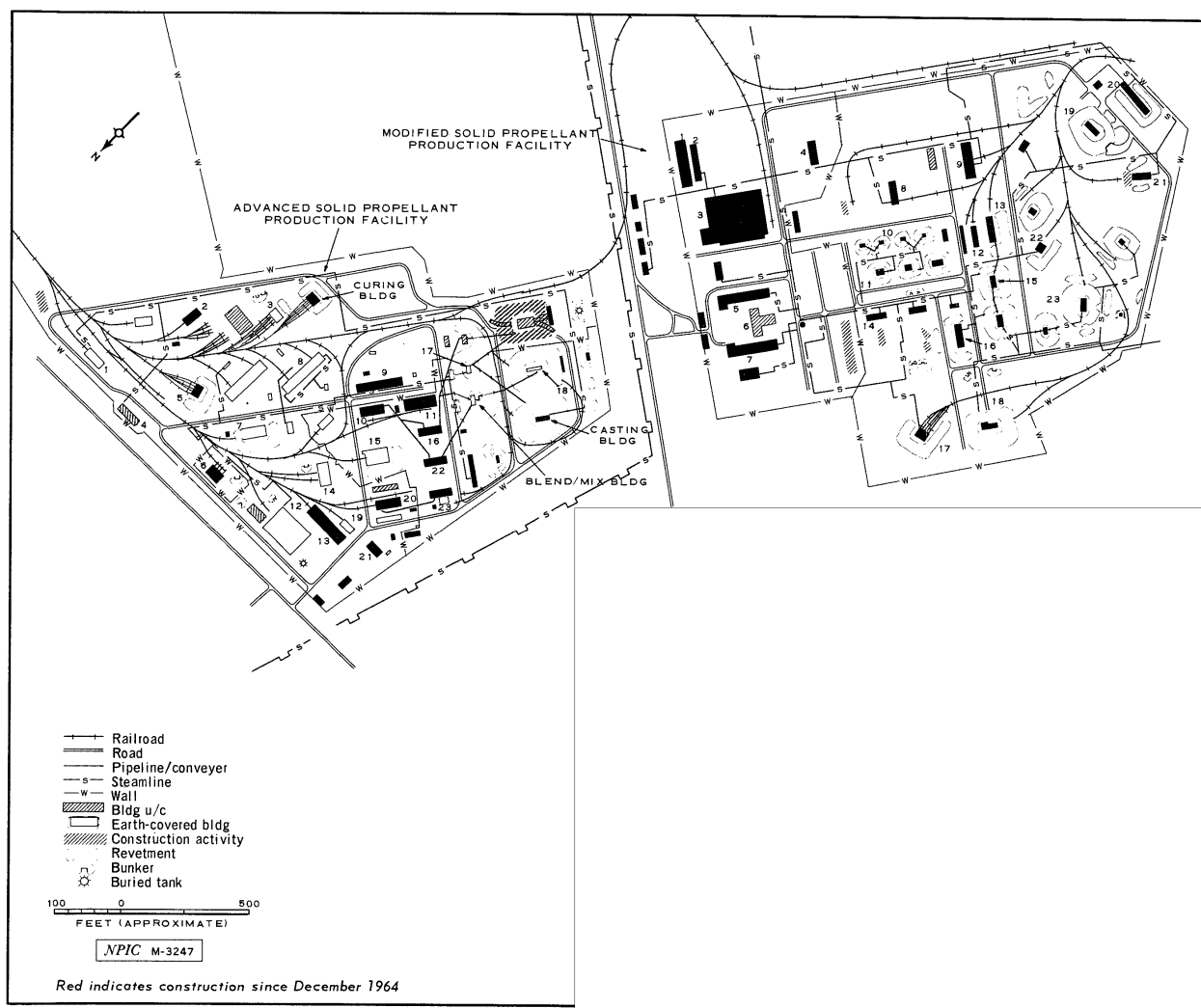
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FIGURE 3. USSR: LAYOUT AND ROOF COVERAGE OF ADVANCED SOLID PROPELLANT PRODUCTION FACILITY AND MODIFIED SOLID PROPELLANT PRODUCTION FACILITY, COMBINE 98 NEAR PERM.

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FIGURE 4. USSR: CONVENTIONAL PROPELLANT PRODUCTION FACILITIES, COMBINE 98 NEAR PERM

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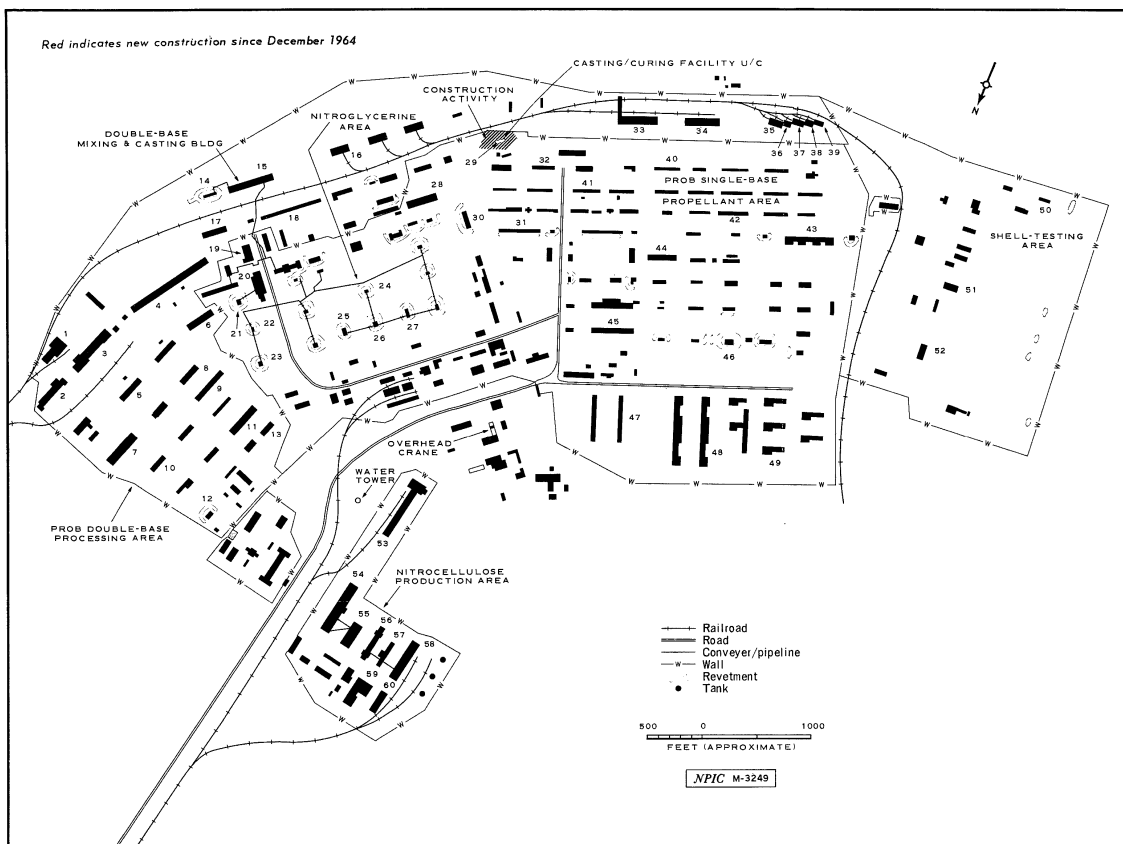


FIGURE 5. USSR: LAYOUT AND ROOF COVERAGE OF CONVENTIONAL PROPELLANT PRODUCTION FACILITIES, COMBINE 98 NEAR PERM.

Perm 5-5

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FIGURE 6. USSR: INDUSTRIAL EXPLOSIVES AREA, COMBINE 98 NEAR PERM

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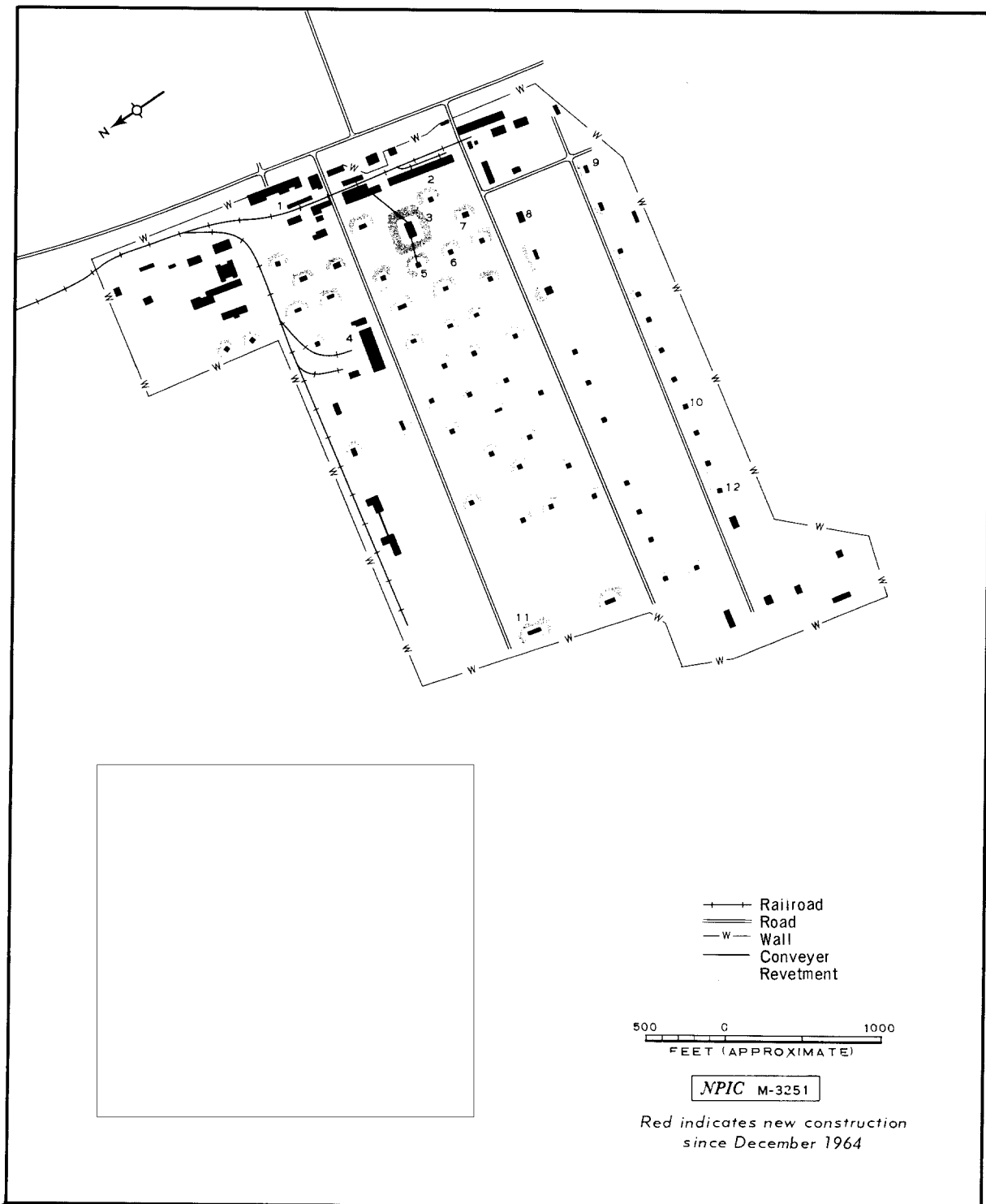
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FIGURE 7. USSR: LAYOUT AND ROOF COVERAGE OF INDUSTRIAL EXPLOSIVES AREA, COMBINE 98 NEAR PERM.

Perm 5-7

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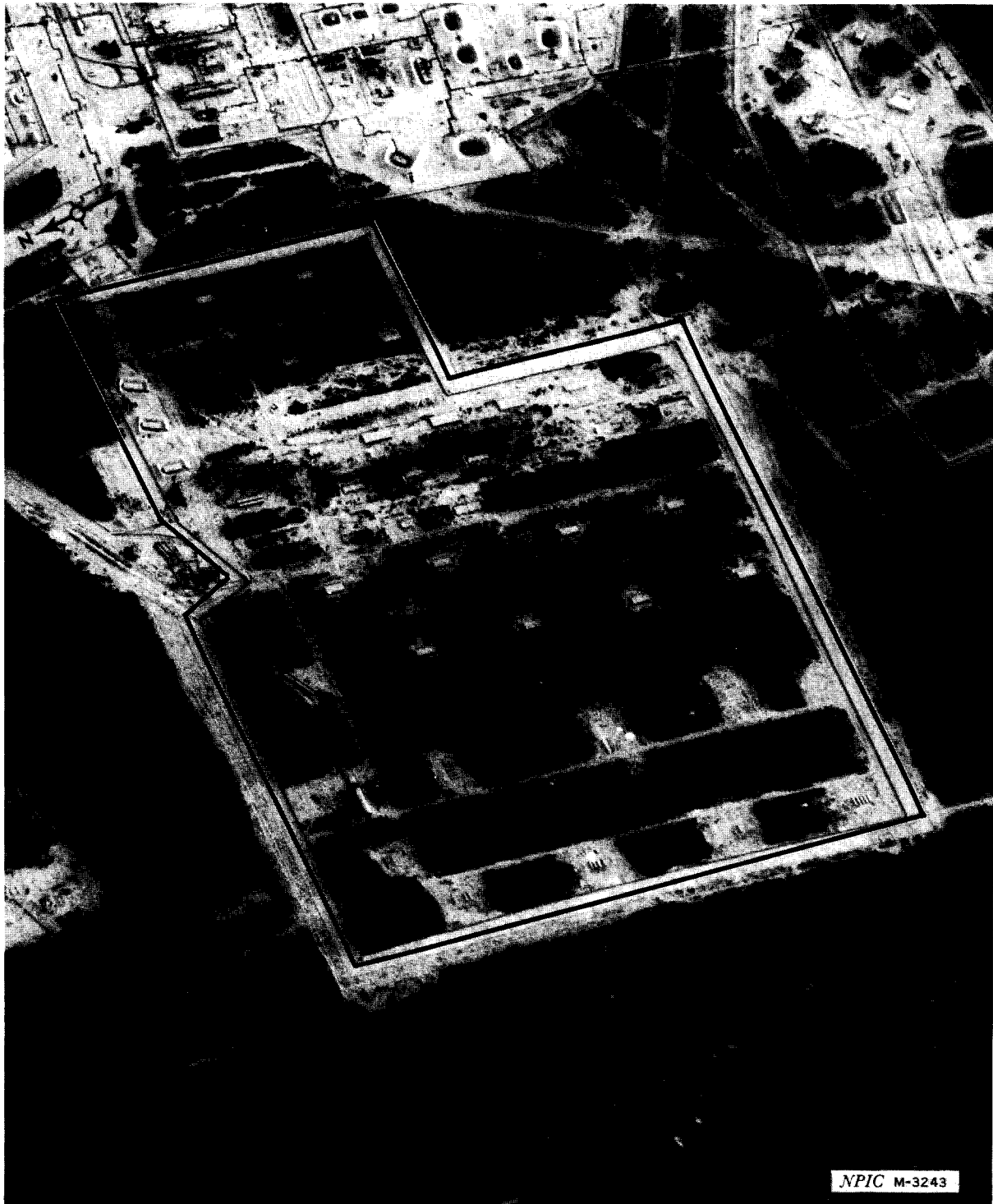


FIGURE 8. USSR: EXPLOSIVES STORAGE AREA, COMBINE 98 NEAR PERM

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Perm 5-8

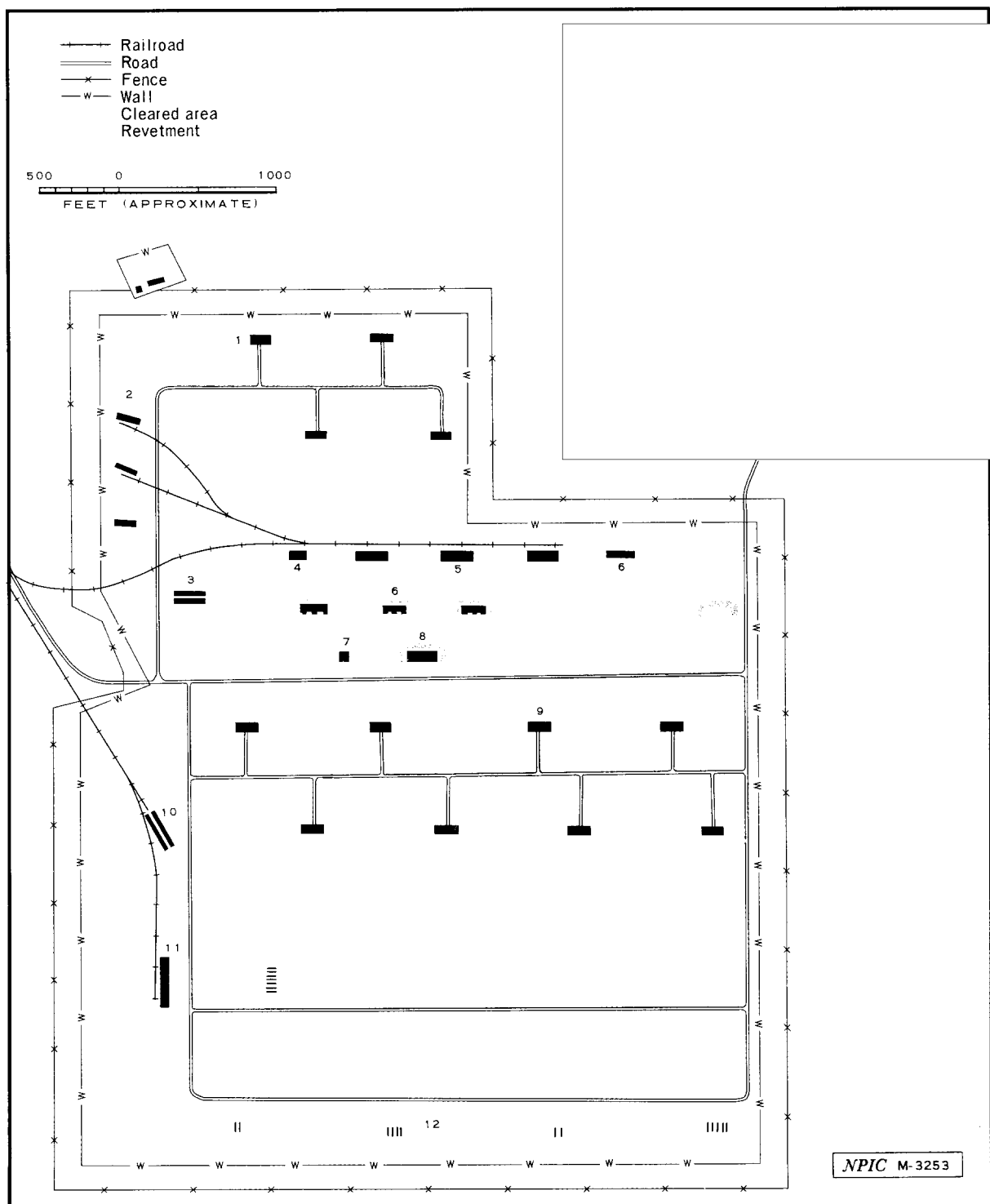
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FIGURE 9. USSR: LAYOUT AND ROOF COVERAGE OF EXPLOSIVES STORAGE AREA, COMBINE 98 NEAR PERM.

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ULAN-UDE

	<u>Section</u>
City of Ulan-Ude	0
Airframe Plant 99	1

Ulan-Ude 0-1

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March 1968

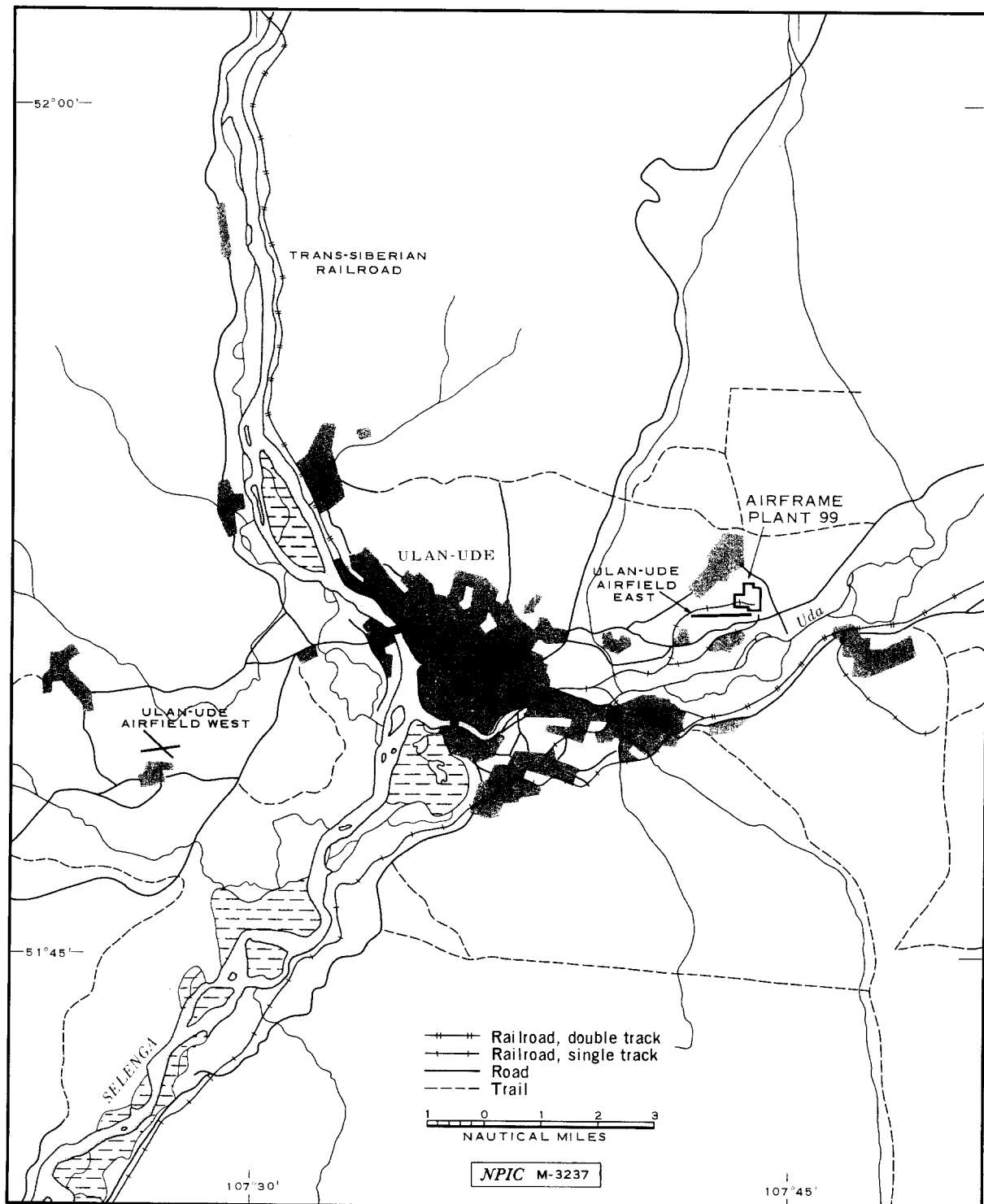
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FIGURE 1. USSR: CITY OF ULAN-UDE.

Ulan-Ude 0-2

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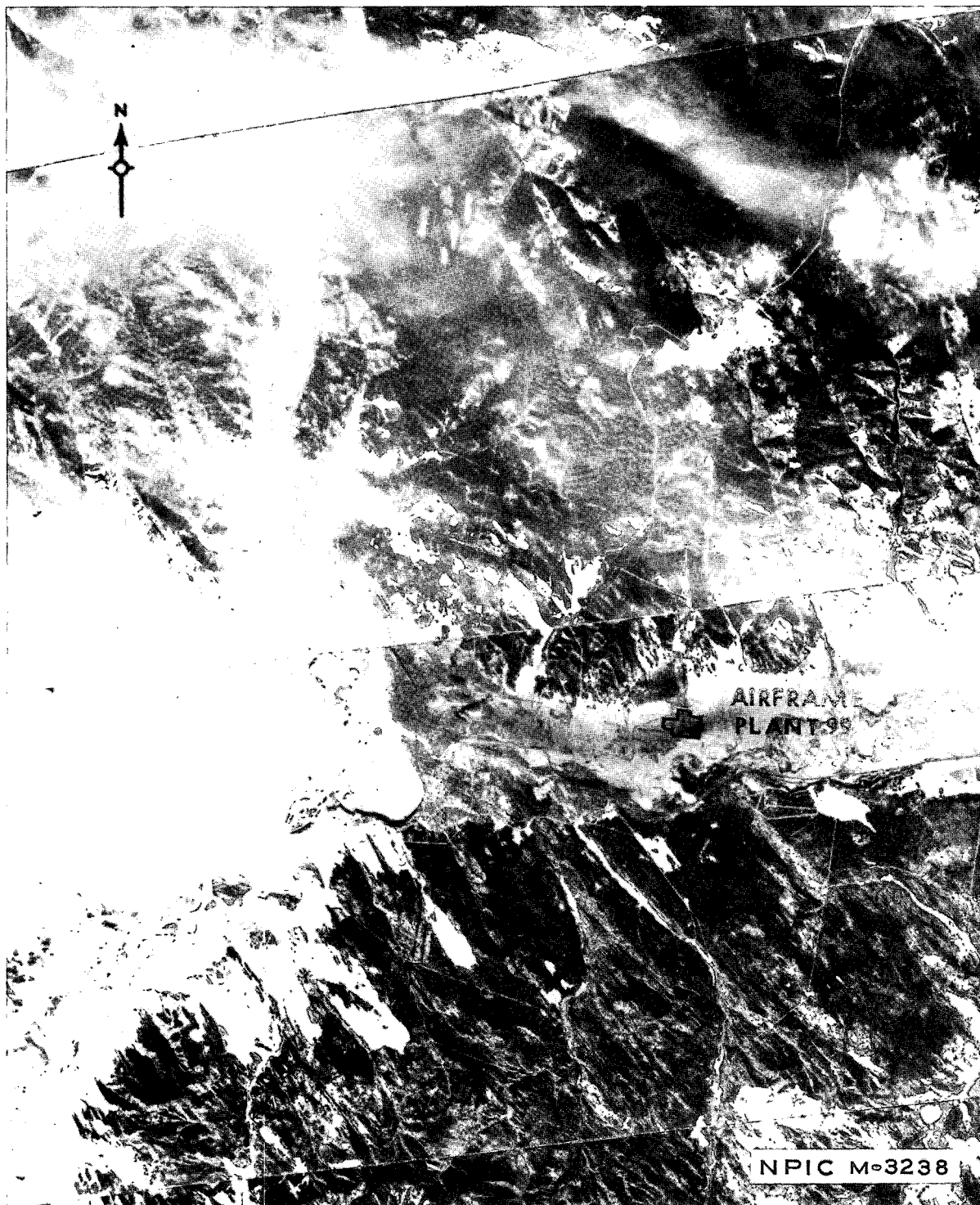


FIGURE 2. USSR: CITY OF ULAN-UDE

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Ulan-Ude 0-3

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March 1968

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ULAN-UDE: AIRFRAME PLANT 99

51-51-20N 107-44-00E; [REDACTED]

25X1

25X1

Tel/Ad KANAT; PO Box 1, 2; Zone 9; T/P 199

Introduction

Airframe Plant 99 is located 5 nautical miles east-northeast of Ulan-Ude, USSR. At the time of the most recent photography, in December 1967, it contained two final assembly/subassembly buildings, a large subassembly building, a large final checkout hangar, a smaller checkout hangar, an engine test and assembly building, two forge/foundry buildings, six workshops, three administration/engineering buildings, a powerplant, and numerous small storage/support buildings.

Photographic Chronology

The Ulan-Ude Airframe Plant 99 was first observed on KEYHOLE photography in [REDACTED]; however, haze and poor interpretability precluded identification of structures. [REDACTED] presented the first opportunity to identify facilities in Plant 99; a large subassembly building (item 4) was then under construction in an area north of a final assembly/subassembly building (item 11). The subassembly building was complete by [REDACTED] and excavating had begun for a checkout hangar (item 1). No photography of the plant was obtained in 1963.

25X1

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25X1

Photography of [REDACTED] revealed the completion of the checkout hangar and a new administration/engineering building (item 8). A new section of wall had also been erected on the east side of the plant to accommodate several new warehouses. Between [REDACTED] an addition was built at the compressor building (item 5). By August 1964 a large new final assembly/subassembly building (item 2) was under construction; the first section of this building to be completed was the final assembly hall, in early 1965. This hall measures [REDACTED] (item 2b).

25X1

25X1

25X1

25X1

Larger-scale photography obtained in [REDACTED] revealed that construction was continuing on the subassembly section of Building 2 (item 2a). An addition to the engine test building (item 6) was erected between January and October 1966.

The construction of the final assembly/subassembly building (item 2) was complete when observed in [REDACTED]. The wall adjacent to the building had been moved approximately 300 feet north to permit further expansion, and ditching observed in this area indicates that additional construction is imminent.

25X1

Ulan-Ude 1-1

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March 1968

Grading for a possible eastern extension of the runway at the contiguous test and flyaway field was observed in 1961 and 1962. The rail spur which had previously crossed the east section of the runway was abandoned by 1964. No attempt has been made to pave or surface the area of grading since the first observations. If completed, this extension would increase the runway length from 5,300 feet to approximately 8,500 feet. The October 1966 photography revealed that a taxiway was under construction to connect the plant to the west end of the flyaway field. Snow cover on the December 1967 photography prevented a determination of the taxiway construction status.

Articles observed in open storage at the plant include approximately 15 to 20 crates seen in the south-central portion. These crates range in size from [redacted] 25X1 [redacted] Inasmuch as these crates have remained in relatively the same 25X1 positions over a period of several years, they probably represent dead storage.

Discussion & Evaluation

Since at least as early as 1961, Plant 99 has been engaged in the production of the SSC-1 SHADDOCK aerodynamic missile and may also be involved with the SSN-3, the naval counterpart of the SSC-1. The plant was assisted in setting up the production of the SSC-1 by Airframe Plant 292 in Saratov, the "lead" plant for the SSC-1/SSN-3 (see Saratov, Section 1). In November 1961, Plant 292 mentioned "Reutovo drawings" in a message to Plant 99. The drawings were undoubtedly from Guided Missile R&D and Production Center Reutovo 67 near Moskva, the R&D center for Soviet cruise missiles including the SSC-1 and the SSN-3 (see Moskva, Section 6). Drawings for "Article 2AD", the Soviet designation for the SSC-1, were mentioned in Plant 99 messages of May 1962 and August 1963. A "ZAKAZ 48" was also mentioned in the August 1963 message and may relate to the terminal dinome "48" in the 4-letter-digit-digit (4LDD) aerodynamic missile designation system; the 4LDD system designates aerodynamic missile systems, components, and subsystems, e.g. 4R48. Terminal dinome 48 is thought to denote the SSN-3.

Plant 99's past production of aircraft has included the U-MIG-15 jet aircraft, KAMOV helicopters, and the Yakovlev-designed MANDRAKE reconnaissance aircraft. The plant is currently producing the AN-24 (COKE) transport aircraft and the KA-25 (HORMONE) antisubmarine warfare (ASW) helicopter.

Ulan-Ude 1-1 (Continued)

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VOTKINSK

	<u>Section</u>
City of Votkinsk	0
Arms Machine and Steel Plant 235	1

Votkinsk 0-1

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March 1968

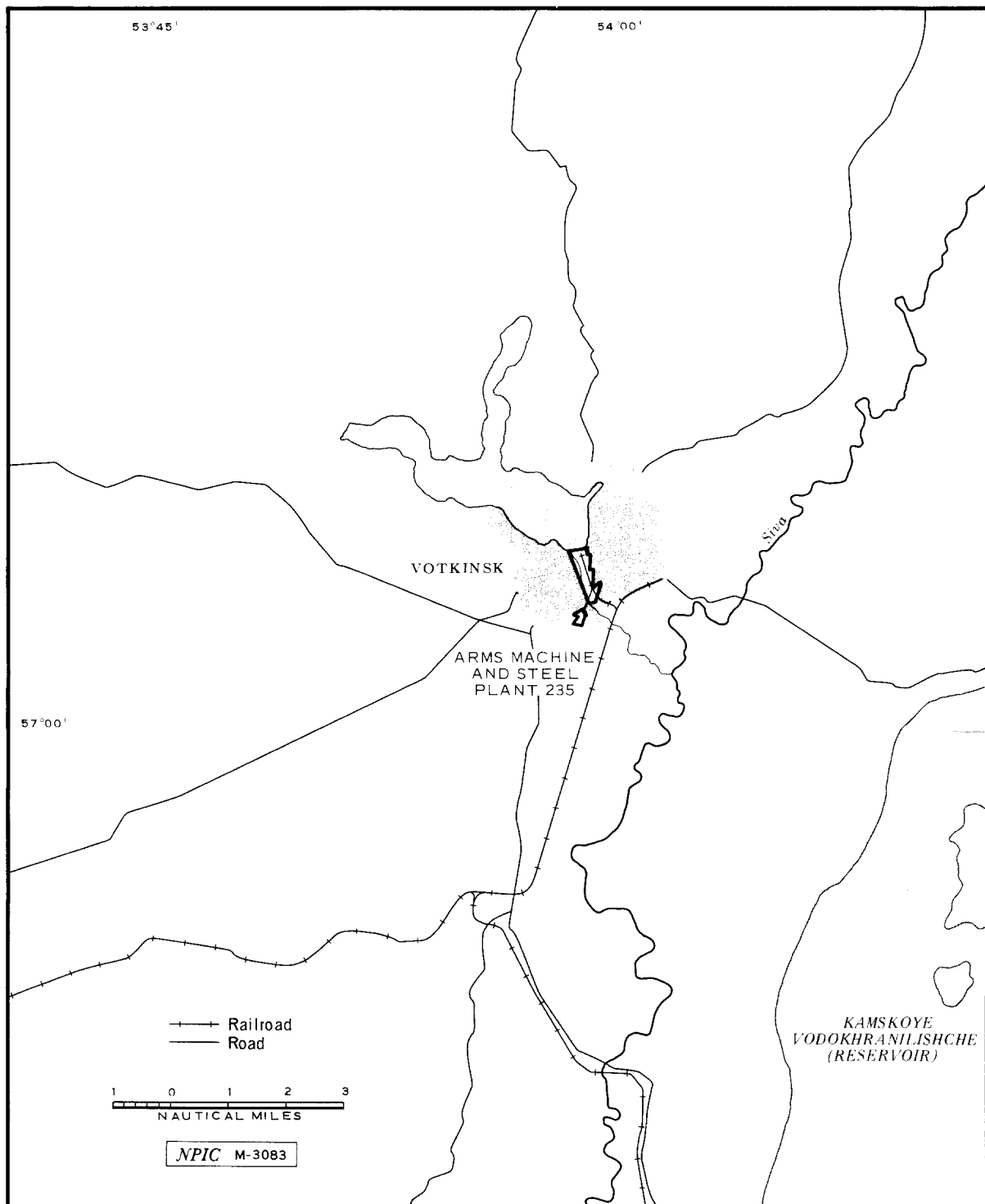


FIGURE 1. USSR: CITY OF VOTKINSK.

Votkinsk 0-2

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VOTKINSK: ARMS MACHINE AND STEEL PLANT 235

57-03-10N 053-59-35E: [REDACTED]

25X1

25X1

Tel/Ad UDARNIK; PO Box 3; Zone ---; T/P ---

Introduction

Arms Machine and Steel Plant 235 is located near the center of Votkinsk, USSR. The plant was in existence prior to the earliest KEYHOLE photographic coverage in 1961; however, 4 principal fabrication/assembly buildings have been built and another enlarged since then. Total floorspace is in excess of 2,298,000 square feet; floorspace of the fabrication buildings totals about 1,468,000 square feet. The most recent photography of the plant was obtained in February 1967.

Photographic Chronology

When Votkinsk Arms Machine and Steel Plant 235 was first observed on KEYHOLE photography in [REDACTED] the facility contained approximately 90 percent of its present roof cover. Photography of [REDACTED] revealed the addition of a large fabrication/assembly building (item 15). [REDACTED] 2 more fabrication/assembly buildings, 1 large and 1 medium sized (items 14 and 27), appeared complete, and 1 bay of a third building (item 17) was also complete. No significant changes were apparent within the plant in 1964 and 1965.

25X1

25X1

25X1

25X1

The fabrication/assembly building observed under construction earlier (item 17) appeared complete in [REDACTED] a new bay had been added to another fabrication/assembly building (item 16) and an additional bay was under construction at a shop building (item 26). The February 1967 photography also revealed possible SCUD missile crates near item 4 in a walled, rail-served area south of the main plant area; similar but slightly smaller crates had been identified previously within a small rail-served walled area (item 13) inside the main plant.

25X1

Discussion & Evaluation

Plant 235 has been identified with the production of the SS-1 (SCUD) missile. The plant contains about 10 major buildings which are light fabrication structures, several smaller fabrication buildings, over 30 support buildings, and a rail-served shipping/receiving yard in the north end of the site.

Votkinsk 1-1

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March 1968

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The plant was reported to have been producing the SS-1 (SCUD) missile in 1958. Early in 1967, crates compatible in size with the SS-1C (SCUD-B) missile were reported in the southeast section of the plant. These reports indicate probable continued production of SCUD at Plant 235. A possible test area containing a possible horizontal test cell is connected to the plant by rail and is located 20 nautical miles southwest of it.

Votkinsk 1-1 (Continued)

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ZLATOUST

	<u>Section</u>
City of Zlatoust	0
Armament Plant 66	1

Zlatoust 0-1

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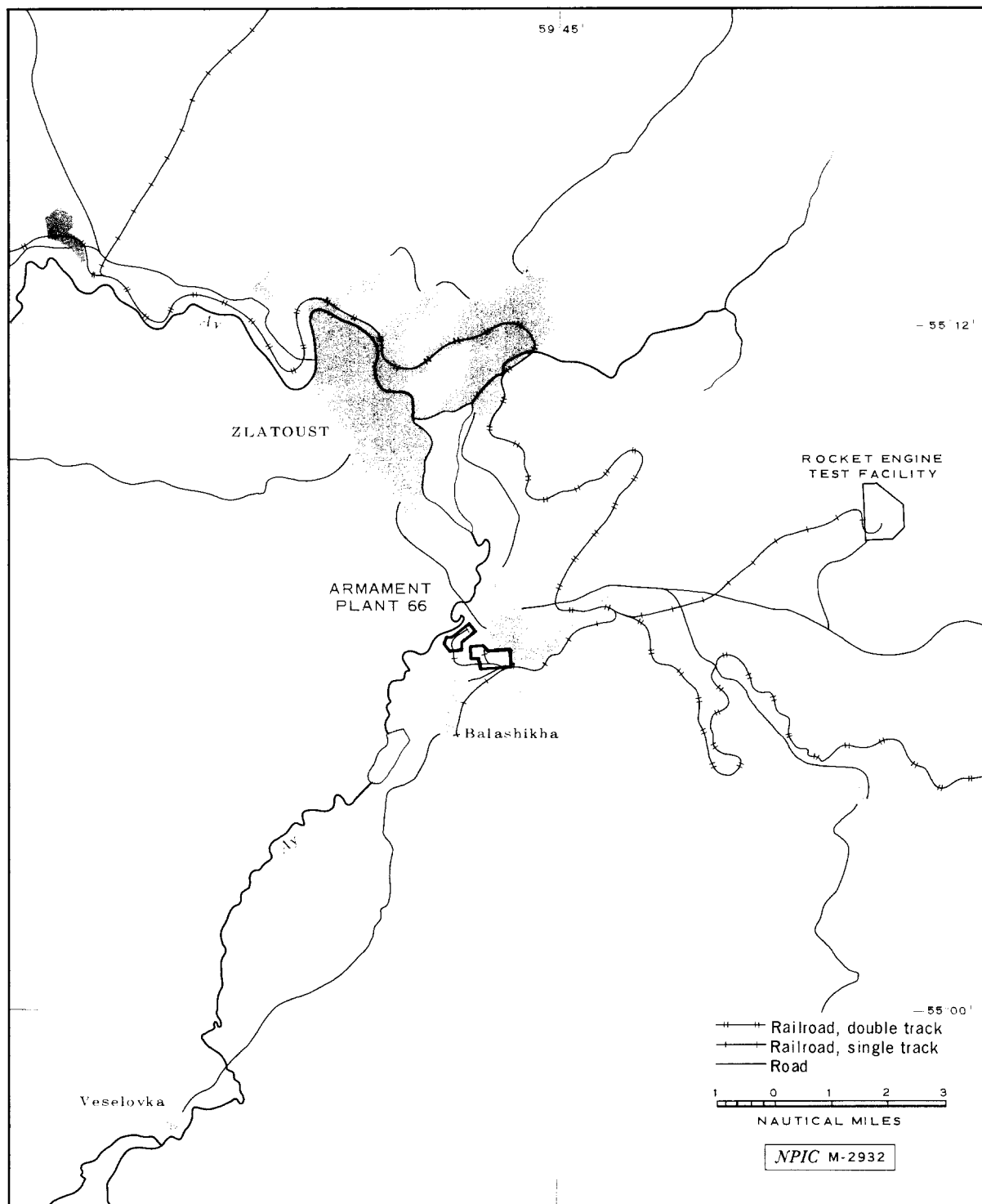


FIGURE 1. USSR: CITY OF ZLATOUST.

Zlatoust 0-2

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March 1968

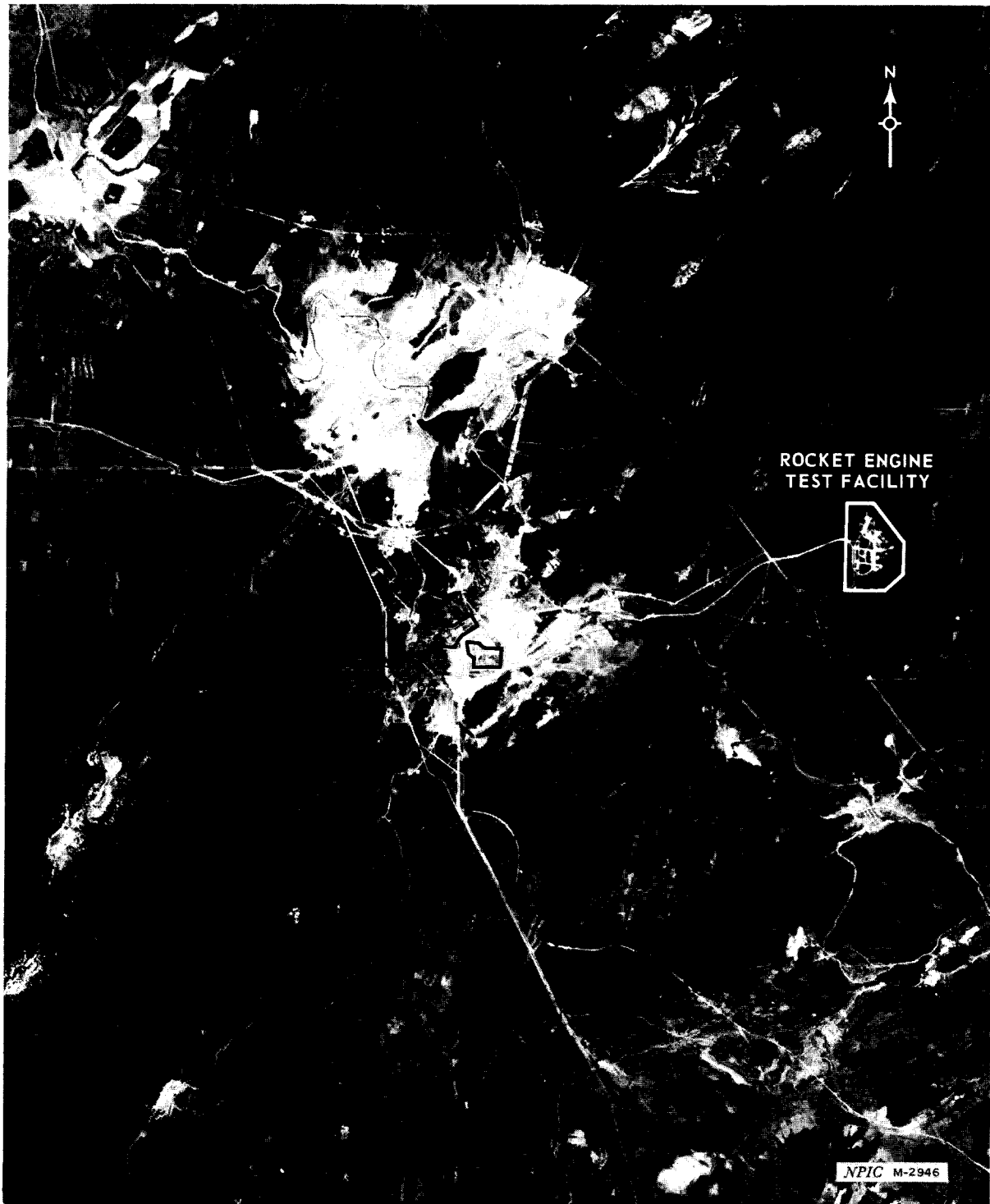


FIGURE 2. USSR: CITY OF ZLATOUST

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Zlatoust 0-3

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ZLATOUST: ARMAMENT PLANT 66

55-06-10N 059-42-45E; [REDACTED]

25X1

25X1

Tel/Ad GROZA; PO Box 36; Zone---; T/P 199

Tel/Ad GRANIT; PO Box 106

Introduction

Armament Plant 66 is situated in a small valley approximately 5 nautical miles (nm) south-southeast of Zlatoust, USSR. The plant comprises 2 separately secured sections designated as the North and South Areas. As of August 1967, the 2 areas contained at least 51 major structures, including a horizontal test building, 5 large fabrication/assembly buildings, and several large shop buildings. Total roof cover for the plant is over 2 million square feet. A rocket engine test facility, confirmed in December 1967, is under construction east of the plant.

Photographic Chronology

Zlatoust Armament Plant 66 was first observed on KEYHOLE photography in [REDACTED] few details were then discernible, however, because of poor image quality. Subsequent photography obtained between June 1962 and July 1963 revealed an addition to a fabrication/assembly building (item 2), the construction of a small workshop (item 8) in the South Area, and initial construction activity for a large new fabrication/assembly building (item 13) in the North Area. The only change observed during 1965 was the beginning of construction for a new shop building (item 6). By [REDACTED] a new high-bay building (item 19) was seen in the North Area and Building 13 appeared externally complete.

25X1

25X1

The most significant and most recent development has been the identification of a horizontal static test building (item 20) in the northwest corner of the plant. This facility was present as early as [REDACTED] but was first identified as a test building on the larger-scale photography of [REDACTED]. The general configuration of the structure is similar to one at the Dnepropetrovsk Missile Development and Production Center (see Dnepropetrovsk, Section 2). The Zlatoust building measures [REDACTED] overall and appears to have 4 test cells directed toward a blast deflector located approximately 111 feet away. A pattern of melted snow on the face of the deflector in March 1967 indicated recent test activity. Five possible SCUD missile crates were observed on [REDACTED] in a secured area in the northern part of Plant 66.

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Zlatoust 1-1

25X1

TOP SECRET

TOP SECRET

March 1968

25X1

one of them adjacent to Building 13. Work was continuing on the new shop building in the South Area, and no additional activity could be seen at the test building.

A suspect missile test facility under construction 7 nm east-northeast of the plant was identified in [REDACTED]. This facility is connected to the plant by rail and contained an apparent vertical test position on the eastern edge. Photography of good interpretability in [REDACTED] permitted the confirmation of this installation as a rocket engine test facility.

25X1

25X1

Discussion & Evaluation

The 2 organizations collocated in the Plant 66 complex produce the SS-1 (SCUD) 150-nautical-mile ballistic missile. Both organizations have been associated with the Dnepropetrovsk Missile Development and Production Center (DMDPC), the lead organization for the SS-1.

In 1961 Plant 66, Telegraphic Address GROZA, contacted the production element of the DMDPC, Telegraphic Address ZVEZDA, about ballistic missile-associated article 8L241. Also in 1961 the other Plant 66 organization (Telegraphic Address GRANIT), which has been concerned with technical documentation and drawings, was associated with Telegraphic Address VOLNA, the design element of the DMDPC, concerning a drawing for an article which carried the SCUD designator 8A61. Six shipping crates with rounded tops, 5 of which are compatible in size to crates associated with the SCUD-B missile, were reported in a secured area outside the large assembly fabrication building in the north plant area. The complex has a horizontal test building similar to one at the DMDPC. Production of the SCUD missile may still be in progress, inasmuch as a new carrier for that system was noted in the November 1965 Moskva parade.

If the new vertical test facility is connected with Plant 66, it would indicate an intention to produce a new missile; at this time, series production of the SS-12 would be likely.

Zlatoust 1-1 (Continued)

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